



Florida Job Growth Grant Fund Workforce Training Grant Proposal

Proposal Instructions: The Florida Job Growth Grant Fund Proposal (this document) must be completed and signed by an authorized representative of the entity applying for the grant. Please read the proposal carefully as some questions may require a separate narrative to be completed.

Entity Information

Name of Entity: Florida SouthWestern State College

Federal Employer Identification Number (if applicable): ██████████

Contact Information:

Primary Contact Name: Dr. Jeffrey Stewart

Title: Provost and Vice President of Academic Affairs

Mailing Address: 8099 College Parkway
Fort Myers, FL 33919

Phone Number: 239-489-9081

Email: Jeffrey.Stewart@fsw.edu

Workforce Training Grant Eligibility

Pursuant to 288.101, F.S., The Florida Job Growth Grant Fund was created to promote economic opportunity by improving public infrastructure and enhancing workforce training. This includes workforce training grants to support programs offered at state colleges and state technical centers.

Eligible entities must submit proposals that:

- Support programs and associated equipment at state colleges and state technical centers.
- Provide participants with transferable and sustainable workforce skills applicable to more than a single employer.
- Are offered to the public.
- Are based on criteria established by the state colleges and state technical centers.
- Prohibit the exclusion of applicants who are unemployed or underemployed.



1. Program Requirements:

Each proposal must include the following information describing how the program satisfies the eligibility requirements listed on page 1.

- A. Provide the title and a detailed description of the proposed workforce training.

See Attached

- B. Describe how this proposal supports programs at state colleges or state technical centers.

See Attached

- C. Describe how this proposal provides participants transferable, sustainable workforce skills applicable to more than a single employer.

See Attached

- D. Does this proposal support a program(s) that is offered to the public?

Yes No

- E. Describe how this proposal is based on criteria established by the state colleges and state technical centers.

See Attached

- F. Does this proposal support a program(s) that will not exclude unemployed or underemployed individuals?

Yes No



G. Describe how this proposal will promote economic opportunity by enhancing workforce training. Please include the number of jobs anticipated to be created from the proposed training. Further, please include the economic impact on the community, region, or state and the associated metrics used to measure the success of the proposed training.

See Attached

2. Additional Information:

A. Is this an expansion of an existing training program? Yes No

If yes, please provide an explanation for how the funds from this grant will be used to enhance the existing program.

B. Does the proposal align with Florida's Targeted Industries? (View Florida's [Targeted Industries here.](#))

Yes No

If yes, please indicate the targeted industries with which the proposal aligns.

If no, with which industries does the proposal align?

Aviation and Aerospace

C. Does the proposal align with an occupation(s) on the Statewide Demand Occupations List and/or the Regional Demand Occupations List? (View Florida's [Demand Occupation Lists here.](#))

Yes No

If yes, please indicate the occupation(s) with which the proposal aligns.

If no, with which occupation does the proposal align?

Airframe Mechanics and Services Technicians (HS/HW SOC 493011) both state-wide and Region 24.



D. Indicate how the training will be delivered (e.g., classroom-based, computer-based, other).

If in-person, identify the location(s) (e.g., city, campus, etc.) where the training will be available.

If computer-based, identify the targeted location(s) (e.g. city, county, statewide) where the training will be available.

All instruction and training will be clock-hour, with general instruction in a classroom and hands-on training based in a hangar setting in Charlotte County. +

E. Indicate the number of anticipated enrolled students and completers.

We project 20-25 students enrolled annually and expect a completion rate of over 90%.

F. Indicate the length of program (e.g., quarters, semesters, weeks, etc.), including anticipated beginning and ending dates.

Begin Date: August - annual End Date: June - annual

G. Describe the plan to support the sustainability of the proposal.

A majority of program costs are associated with program startup. Additional funding is sought to cover facilities renovation of two (2) years. Student tuition and fees, Perkins Grant funding, in-kind contributions, and college operating funds will defray subsequent annual recurring program costs. +

H. Identify any certifications, degrees, etc. that will result from the completion of the program. Please include the Classification of Instructional Programs (CIP) code if applicable.

After program completion, students will receiving a FAA Part 147 approved Postsecondary Adult Vocational Certificate in Aviation Airframe and Aviation Powerplant Mechanics (CIP 0647060 and 0647060801) Potential Associate in +



I. Does this project have a local match amount?

Yes No

If yes, please describe the entity providing the match and the amount.

See Attached

J. Provide any additional information or attachments to be considered for the proposal.

Please find attached EMSI study, related industry employment outlooks, and other supporting material.

3. Program Budget

Estimated Costs and Sources of Funding: Include all applicable workforce training costs and other funding sources available to support the proposal.

A. Workforce Training Project Costs:

Equipment	\$ 2,010,849	
Personnel	\$ 0	
Facilities	\$ 410,550	
Tuition	\$ 0	
Training Materials	\$ 0	
Other	\$ 0	Please Specify: _____
Total Project Costs	\$ 2,421,399	

B. Other Workforce Training Project Funding Sources:

City/County	\$ _____	
Private Sources	\$ _____	
Other (grants, etc.)	\$ _____	Please Specify: _____
Total Other Funding	\$ _____	

Total Amount Requested \$ 2,421,399

Note: The total amount requested must equal the difference between the workforce training project costs in 3.A. and the other workforce training project funding sources in 3.B.



- C. Provide a detailed budget narrative, including the timing and steps necessary to obtain the funding, how equipment purchases will be associated with the training program, if applicable, and any other pertinent budget-related information.

See Attached

4. Approvals and Authority

- A. If entity is awarded grant funds based on this proposal, what approvals must be obtained before it can execute a grant agreement with the Florida Department of Economic Opportunity (e.g., approval of a board, commission or council)?

Approval must be obtained from Florida SouthWestern State College Board of Trustees.

- B. If approval of a board, commission, council or other group is needed prior to execution of an agreement between the entity and the Florida Department of Economic Opportunity:

- i. Provide the schedule of upcoming meetings for the group for a period of at least six months.

Board meetings are held at 3 p.m. on the 4th Tuesday of the months of August, ~~September~~, ~~November~~, ~~February~~, and ~~June~~

- ii. State whether that group can hold special meetings, and if so, upon how many days' notice.

Approval will be conducted during regular board meeting times.

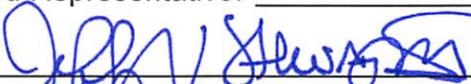
- C. Attach evidence that the undersigned has all necessary authority to execute this proposal on behalf of the entity. This evidence may take a variety of forms, including but not limited to: a delegation of authority, citation to relevant laws or codes, policy documents, etc.



I, the undersigned, do hereby certify that I have express authority to sign this proposal on behalf of the above-described entity.

Name of Entity: Florida SouthWestern State College

Name and Title of Authorized Representative: Dr. Jeffrey Stewart

Representative Signature: 

Signature Date: 11/6/12

Florida Job Growth Grant Fund
Workforce Training Grant Proposal
Florida SouthWestern State College

A. Provide the title and a detailed description of the proposed workforce training.

Airframe/Powerplant Mechanic - Florida SouthWestern State College (FSW) will provide training leading to FAA approved Postsecondary Adult Vocational Certificates (PSAVs) in Aviation Airframe Mechanics and Aviation Powerplant Mechanics. Establishment of these programs leads to a potential Associate in Science (AS) degree program in Aviation Maintenance Management.

B. Describe how this proposal supports programs at state colleges or state technical centers.

A program gap analysis performed by EMSI in September 2015 details that a ten county A&P Region encompassing Manatee, Sarasota, Charlotte Lee, Collier, Hardee, DeSoto, Glades, Hendry, Palm Beach and a portion of Glades County indicates that of the current existing demand for A&P mechanics in the region, only 25% percent of the demand for workforce is currently being met in the region is being met by all educational institutions in the same region. Furthermore, none (0%) of the existing demand for Associate's degree workforce is met within the region. The FSW A&P program will be the first and only Associate's level program provided by a state college in the region and the second of two institutions providing related certificate programs. FSW will be the only institution in the region offering both a postsecondary certificate and a potential associate's degree option for the A&P program.

The level of workforce production within the State in the aggregate is insufficient to meet the demand of existing employers. The FSW A&P program will add additional capacity to meet existing needs and to further efforts to expand statewide efforts to attract additional employers, more specifically to catalyze aviation industry expansion within SW Florida.

FIGURE 1: MAP OF FSW A&P REGION



TABLE 1: SUMMARY OF COMPLETIONS FOR A&P PROGRAMS IN FLORIDA STATE

A&P PROGRAM INSTITUTIONS	CERTIFICATES	ASSOCIATE'S DEGREES	TOTAL COMPLETIONS	PERCENT OF TOTAL
Aviation Institute of Maintenance-Orlando	79	0	79	12%
Broward College	95	0	95	14%
Embry-Riddle Aeronautical University-Daytona Beach	0	27	27	4%
Embry-Riddle Aeronautical University-Worldwide	0	39	39	6%
Florida State College at Jacksonville	46	0	46	7%
George T Baker Aviation School	107	0	107	16%
Lively Technical Center	12	0	12	2%
Lorenzo Walker Institute of Technology	10	0	10	1%
National Aviation Academy of Tampa Bay	248	0	248	36%
Tom P Haney Technical Center	17	0	17	3%
Grand Total	614	66	680	100%
AVIATION/AIRWAY MANAGEMENT & OPERATIONS PROGRAM INSTITUTIONS	CERTIFICATES	ASSOCIATE'S DEGREES	TOTAL COMPLETIONS	PERCENT OF TOTAL
Broward College	7	104	110	37%
Embry-Riddle Aeronautical University-Worldwide	0	0	0	0%
Florida State College at Jacksonville	0	75	75	25%
Miami Dade College	31	75	106	35%
Palm Beach State College	0	1	1	0%
Santa Fe College	0	2	2	1%
St Petersburg College	0	5	5	2%
Grand Total	38	262	299	100%

All figures are a 3-year average

Source: National Center for Education Statistics – IPEDS

- C. Describe how this proposal provides participants transferable, sustainable workforce skills applicable to more than a single employer.

This introduction to Boeing’s Market Outlook Report for 2016-2035 perfectly captures the purpose of this grant request:

“As global economies expand and airlines take delivery of tens of thousands of new commercial jetliners over the next 20 years, there is extraordinary demand for people to fly and maintain these airplanes. To meet this tremendous growth, the 2016 Boeing Pilot and Technician Outlook forecasts that between now and 2035, the aviation industry will need to supply more than two million new aviation personnel - 617,000 commercial airline pilots, 679,000 maintenance technicians, and 814,000 cabin crew.

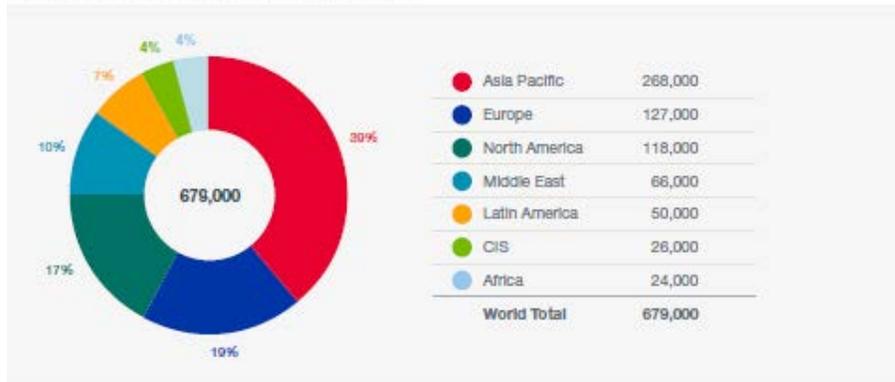
Meeting this demand will require innovative solutions - focused on educational outreach and career pipeline programs - to inspire the next generation of pilots, technicians, and cabin crew. New technologies, devices, and training methods will be needed to meet a wide range of learning styles. The growing diversity of aviation personnel will also require instructors to have cross-cultural and cross-generational skills to engage tomorrow's workforce.”

According to this leading report, worldwide demand for maintenance personnel is approximately 679,000 needed personnel from 2016-2035. In North America alone, the demand is projected at 127,000, the second highest demand, with only the Asia Pacific market with a higher need.

Beyond the aviation and aerospace industries, A&P trained and educated workers are highly sought after with skills that are transferable to several industries including: advanced manufacturing, life sciences in the development and production of medical devices, defense and Homeland Security, Logistics/Distribution, CleanTech and automotive industries.

The FSW A&P program is not intended to support a single employer, but more accurately, to provide support and workforce pipeline to all employers in these industries.

New Technicians by Region: 2016–2035



Source: Boeing Current Market Outlook Report, 2016

- D. Does this proposal support a program that is offered to the public? YES
- E. Describe how this proposal is based on criteria established by the state colleges and state technical centers.

This is best described by citing the missions and goals established by several statewide workforce and economic development related entities, including:

FSW mission:

The mission of Florida SouthWestern State College is to inspire learning; prepare a diverse population for creative and responsible participation in a global society; and serve as a leader for intellectual, economic, and cultural awareness in the community.

Florida College System Mission:

The mission of the Florida College System is to provide access to high-quality, affordable academic and career educational programs that maximize student learning and success, develop a globally competitive workforce and respond rapidly to diverse state and community needs.

CareerSource Florida Goals in support of WIOA:

Goal 1: Enhance alignment and market responsiveness of workforce, education and economic development systems through improved service integration that provide:

- Businesses with skilled, productive, and competitive talent; and

- Floridians with employment, education, training, and support services that reduce welfare dependence and increase opportunities for self-sufficiency, high-skill and high-wage careers and lifelong learning.

Goal 3. Improve career exploration, educational attainment and skills training for in-demand industries and occupations for Florida youth that lead to enhanced employment, career development, credentialing and post-secondary education.

Additionally, priorities established by Governor Scott in which include creating a world class education system and making Florida the number one state for job creation.

- F. Does this proposal support a program(s) that will not exclude unemployed or underemployed individuals? YES
- G. Describe how this proposal will promote economic opportunity by enhancing workforce training. Please include the number of jobs anticipated to be created from this proposed training. Further, please include the economic impact on the community, region, or state and the associated metrics used to measure the success of the training program.

Charlotte County in particular, and Southwest Florida in general has an older age demographic than many parts of the State and certainly the country. This results in lower workforce participation statistics, in Charlotte County workforce participation is 43%, Lee and Collier County participation rates are at 53% as compared to Duval and Hillsborough counties with participation rates over 63%. Increasing the educational opportunities available to K-12 graduates and adults seeking to retrain and advance their skills is critical in attracting new workforce age families and retaining K-12 graduates in the region. Industry specific certificate and degree programs are critical in creating a pipeline of workforce close to which companies in demand for that specific skill set, will locate.

The FSW A&P programs are slated to commence with 25 student seats at both the certificate and associate's degree level. The ability to expand this output is largely dependent upon funding for expansion as well as program participation. Based on the significant gap between graduates and industry demand, it is reasonable to conclude that expansion of the program outputs will be likely.

An economic impact of the A&P program was provided with the Program Gap Analysis conducted by EMSI (attached). This analysis concludes that the total economic impacts of the program to the regional economy over a ten year period will be over \$118.2 Million based on existing employers and demand in the region. This does not take into account impact in industries outside of Aviation nor the expansion of the industry cluster as a result of providing additional educational opportunities.

The FSW A&P program will be based at FSW's Charlotte campus and the Punta Gorda Airport (PGD). To illustrate potential economic impacts, this analysis looks at just the immediate

Charlotte County outlook, results can be extrapolated out for the entire region with some assumptions made for distance from the physical program location. This area has been designated as a targeted employment area and 4,000 acres zoned and permitted for industrial uses, such as manufacturing and distribution. Of the total, approximately 1,900 acres is part of the Punta Gorda Airport, the balance being in private ownership with varying degrees of site readiness. If the remaining acreage is built out with job creating users at a conservative rate of 3% per year the following impacts can be expected:

Development of 63 acres annually at a rate of 10,000 sf per year = 630,000 sf of new industrial space.

Capital Investment for physical plant assumes a conservative \$100/sf = \$63,000,000 of capital investment.

630,000 sf of new space/ 892 sf per employee = 706 new jobs

Average annual wage for manufacturing in FSW A&P region = \$24.81/hour (\$51,604 annually)

Total annual new salary = # jobs * wage = \$37,432,424

Charlotte County average annual wage for 2016 = \$37,011

FIGURE 3: POSTSECONDARY CERTIFICATE SUPPLY AND DEMAND FOR THE A&P PROGRAMS IN THE FSW A&P REGION

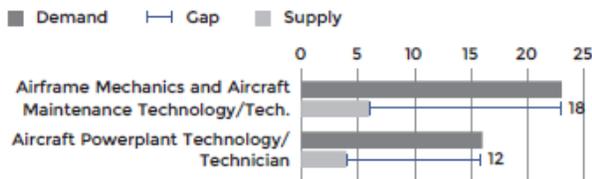


FIGURE 4: ASSOCIATE'S DEGREE SUPPLY AND DEMAND FOR THE A&P PROGRAMS IN THE FSW A&P REGION

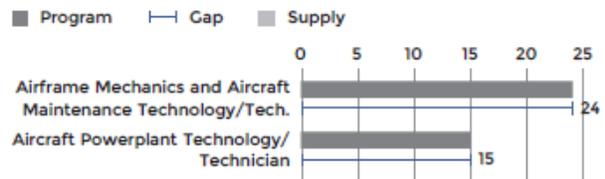


Figure 18
Manufacturing Industries
(Square Feet per Employee)

	Square Feet per Employee		
	1998	2002	2006
Food manufacturing	515	483	567
Beverage and tobacco product	990	874	1273
Textile mills and textile product mills	887	787	1552
Apparel manufacturing	534	230	704
Leather and allied product manufacturing	568	495	755
Wood product manufacturing	617	726	1091
Paper manufacturing	994	959	1132
Printing and related support activities	517	537	836
Petroleum and coal products manufacturing	714	633	570
Chemical manufacturing	1262	685	870
Plastics and rubber products manufacturing	899	807	1218
Nonmetallic mineral product manufacturing	785	904	973
Primary metal manufacturing	965	885	1306
Fabricated metal product manufacturing	757	729	964
Machinery manufacturing	708	566	860
Computer and electronic product manufacturing	360	365	429
Electrical equipment, appliance, and component manufacturing	2285	523	821
Transportation equipment manufacturing	544	540	999
Furniture and related product manufacturing	715	693	1558
Miscellaneous manufacturing	569	550	719
Manufacturing	744	617	892

Source: Energy Information Agency (EIA), Manufacturing Energy Consumption Survey (MECS),
Regional Plan Association (RPA) Calculations

SECTION 2: Additional Information

- I. Does the project have a local match amount? YES

If yes please describe the entity providing the match and the amount

Florida SouthWestern State College has invested resources in equipment, property (hangar at \$50,000 annually), and curriculum consultants (\$16,000), and if approved, estimated recurring expenses of \$233,708.96. FSW is also in discussions with aviation industry companies for potential in-kind contributions of aircraft estimated at \$1,209,000.

Section 3: Program Budget

C. Provide a detailed budget narrative, including timing and steps necessary to obtain the funding, how equipment purchases will be associated with the training program, if applicable, and any other pertinent budget-related information.

The majority of costs (\$2,010,849) consist of initial equipment, supplies, and materials essential to airframe and powerplant maintenance instruction (see attachment for examples). Remaining estimated costs of \$410,550 are for retrofitting the existing leased hangar for the instructional program. This includes:

Arch/Eng Design, permit drawings	\$25,000
Construction (including classroom)	\$360,000
Furniture	\$4,000.00 (Office)
Move in	\$2,000
Misc	\$19,550

If grant funding is approved, and upon distribution of funds, FSW will purchase supplies and equipment based a schedule of events determined by the FAA. Initial, year-one purchases will be used to create student teaching stations for the General and Airframe certification program. Concurrently, FSW will renovate our currently leased hangar to include a classroom, offices, and other teaching spaces. Subsequent purchases will be used to fund equipment and supplies for a year-two implementation of the Powerplant certification program.

Bruce Laishley
Florida Premier Contractors, LLC
3691 Tamiami Trail
Punta Gorda, FL 33950

November 2, 2017

To Whom It May Concern,

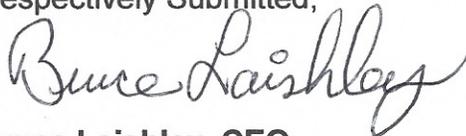
As a recent, Governor Scott appointed member of the Florida Southwestern State College ("FSW") District Board of Trustees, I am delighted to hear of new learning opportunities at our college. The proposed FAA Airframe & Powerplant certification course being considered at FSW's Charlotte County campus will continue to funnel qualified graduates into an ever-expanding job market. I use the term "being considered" as this program is contingent upon funding from the Florida Job Growth Grant Fund program.

Obviously as a board member of this institution, I would encourage funding for this program. But I am also a life-long resident of this community and a business owner employing hundreds of individuals. My business success depends on young, talented, and trained individuals, like the future graduates of an Airframe & Powerplant program, entering our workforce. As such, I fully support FSW's request for funding to the Florida Job Growth Grant Fund.

I am always excited when new businesses come to Florida, or existing ones announce expansion plans. I believe degree programs such as the FAA Airframe & Powerplant certification course will continue to help make that happen.

Your consideration is appreciated. Thank you.

Respectively Submitted,



Bruce Laishley, CEO
Florida Premier Contractors, LLC
3691 Tamiami Trail Punta Gorda, FL 33950
bruce@brucelaishley.com
Office 941 205-1400
Mobile 941 875-4783



Phone (941) 360-6877

Fax (941) 360-6878

www.SarasotaAvionics.com

Support@SarasotaAvionics.com

VENICE (VNC) - Avionics
Venice Municipal Airport
120 Airport Avenue West
Venice, FL 34285

VENICE - Maintenance
Venice Municipal Airport
140 Airport Avenue East
Venice, FL 34285

SARASOTA (SRQ)
Sarasota-Bradenton
International Airport
8191 N. Tamiami Trail
Hangar B-2
Sarasota, FL 34243

LANTANA (LNA)
Palm Beach County Park
Airport
2633 Lantana Rd
Hangar 214
Lantana, FL 33462

TAMPA (TPF)
Peter O. Knight Airport
845 Severn Avenue
Tampa, FL 33606

PUNTA GORDA (PGD)
Charlotte County Airport
28000 Airport Rd, #A-3
Punta Gorda, FL 33982

August 29, 2017

To: Stephen Nowell
Florida Southwestern State College

RE: A&P Program at PGD airport

Mr. Nowell:

It has come to our attention that Florida Southwestern State College may be starting up an A&P program in the two hangars next to our facility in Punta Gorda. This letter is confirmation that we would certainly consider your graduates for employment if we have openings for maintenance technicians.

If you would like to discuss this matter further, you can reach me at 1-941-360-6877, ext. 100, or by email at Shawn@SarasotaAvionics.com.

Sincerely,

Shawn McClintock
Vice President



August 29, 2017

To whom it may concern:

We understand that, as part of the Florida Job Growth Fund Program, Florida SouthWestern State College (FSW) has applied for funding to assist in the startup costs of an FAA Airframe & Powerplant certification course at the Charlotte County Campus in Punta Gorda. This course will allow successful candidates the opportunity to obtain FAA mechanic certification.

As reported in numerous aviation publications (AINonline-1/1/16, Forbes-4/24/17, Brink News-4/26/17, etc.) a severe maintenance technician shortage is predicted over the next 20 years in North America. Graduates of the FSW certification program will provide a ready Workforce for aviation and other industries across all of Southwest Florida. This convenient and affordable program would be a huge asset to aviation employers across Southwest Florida. We would absolutely be interested in hiring graduates for full-time long-term employment.

Our company fully supports FSW's application to the Florida Job Growth Grant Fund and recognizes the value it will bring to the Southwest Florida aviation community. We encourage you to favorably consider FSW's application. Please contact me with any questions or for further assistance.

Sincerely,

Janet Trudeau
Owner / CFO

Charlotte County Airport (KPGD)
28000 Airport Road, Building 208, Suite A-4 • Punta Gorda, Florida 33982
P: 941.505.0088 • F: 941.505.0063

www.trudeauwarbird.com



August 29, 2017

Mr. Stephen R. Nowell

School of Business & Technology
Florida SouthWestern State College
Punta Gorda, Fl. 33950

Subject:

Dear Mr. Nowell,

I understand that you are working towards the startup of training programs for airframe and powerplant mechanic certifications at Florida Southwestern State College. We here at Turbine Weld Inc. fully support your endeavor and look forward to considering your future graduates for employment with our company.

We have already hired two (2) of your former students as mechanics for our sheet metal repair group and certainly will have more openings in the future. As you know from your previous visits to our facility we perform a variety of different operations that give our employees a chance to develop many different skills. We have been in business at our current location in Florida since 1993 and have approximately 35 non administrative employees. We provide competitive wages and excellent benefits and as a result have minimal turnover. The average tenure of our employees is over sixteen (16) years.

However, we are aware that our workforce is aging. That is one of the few downsides to low turnover. As some of our employees elect to retire in the coming years we lose some great workers and their collective experience and knowledge. We will need to fill these positions with new hires.

We have not had good luck recruiting suitable employees in the current job market. It seems that there is a shortage of prospective workers that have the interest, and the work ethic that we value in our employees. We are developing a somewhat jaded opinion of the newest generation of workers at least locally. The notable exception to this experience is the two (2) young men that had participated in a class or program that you had taught. That is why we are so encouraged by the startup of your program. If a student can successfully complete your program, we, as a potential employer, will already know something of the individuals' level of interest in our field and their work ethic.

Please feel free to share this letter with whomever you need to if it might help secure your startup goals. Good luck from all of us at Turbine Weld.

Very truly yours,

Timothy Hall /GM

Turbine Weld Inc.

28000 A-1 Airport Road
Punta Gorda, Florida 33982
www.flypgd.com



(941) 639-1101
(941) 639-4792 Fax
airport@flypgd.com

August 30, 2017

To whom it may concern:

As part of the Florida Job Growth Grant Fund program, Florida SouthWestern State College (FSW) has applied for funding to assist in the startup costs of an FAA Airframe & Powerplant certification course at the Charlotte County Campus in Punta Gorda. This course will allow successful candidates to sit for their FAA certification.

The Charlotte County Airport Authority fully supports FSW's application to the Florida Job Growth Grant Fund and we recognize the value it will bring to aviation employers in Southwest Florida.

Graduates of this certification program will provide a ready workforce for aviation and other industries across Southwest Florida through a convenient and affordable program of education. Commercial aviation will require an estimated 13,000 new technicians in North America over the next 20 years. Recognizing the value of the Airframe and Powerplant certification, the Charlotte County Airport Authority looks favorably on job applicants who are either enrolled or have completed an Airframe & Powerplant certification program. We have recruited a number of individuals with this education and experience.

We request your favorable consideration of Florida SouthWestern State College's application. If I can be of further assistance, please contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "James W. Parish", is written over a large, stylized blue scribble.

James W. Parish, Chief Executive Officer



To whom it may concern.

As part of the Florida Job Growth Grant Fund program, Florida SouthWestern State College (FSW) has applied for funding to assist in the startup costs of an FAA Airframe & Powerplant certification course at the Charlotte County Campus in Punta Gorda. This course will allow successful candidates to sit for their FAA certification.

Arcadia Aerospace (AAI) fully supports FSW's application to the Florida Job Growth Grant Fund and recognizes the value it will bring to aviation employers in Southwest Florida like my own company. AAI has in the past hire several A&P certificate holders who have gone on to build successful and sought-after careers in our company and in the aerospace sector at large. A&P programs give the students the perfect building blocks for aerospace careers as it introduces them to work within a highly regulated quality system, detail, procedure oriented duties and personable accountability.

Graduates of this certification program will provide a ready workforce for aviation and other industries across all of Southwest Florida through a convenient and affordable program of education. Commercial aviation will require an estimated 13,000 new technicians in North America over the next 20 years. AAI expects to hire 2-4 Airframe & Powerplant graduates each year for the next 12 years.

I request your favorable consideration of Florida SouthWestern State College's application. If I can be of further assistance. please contact me.

Sincerely,

A handwritten signature in black ink that reads "Jeff Phillips". The signature is written in a cursive style with a large, stylized "J" and "P".

Jeffrey Phillips, VP



To whom it may concern.

As part of the Florida Job Growth Grant Fund program, Florida South Western State College (FSW) has applied for funding to assist in the startup costs of an FAA Airframe & Power plant certification course. This training will be conducted at the FSW Charlotte County Campus and the Airport in Punta Gorda, Florida.

We, at the WMU College of Aviation, fully support this application to the Florida Job Growth Grant Fund and recognize the value it will bring to aviation employers in South West Florida and our own university.

We will be offering internships and employment opportunities to these graduates. It will be our pleasure to offer any assistance we can to this unique college level program. We only request your favorable consideration of their application.

If I can be of further assistance. please contact me at the numbers below.

Sincerely,



James A. Williams

Director of Flight Operations and Safety

WMU College of Aviation, Punta Gorda Extension

941-676-2957

James.1.williams@wmich.edu



Your Business. Cleared for Takeoff.

August 30, 2017

Mr. Adrian Kerr
Director of Corporate Training
School of Business
FSW State College
8099 College Parkway
Fort Myers, FL 33919

Dear Adrian,

The Charlotte County Economic Development Office ("EDO") is providing this letter on behalf of the Charlotte County community supporting an FAA Airframe & Powerplant certification course at the Florida SouthWestern State College ("FSW").

With the proposed certification course at the Charlotte County Campus in Punta Gorda, Florida, Charlotte County is poised to attract aviation-related companies and new jobs to the region as the program produces qualified graduates. It is imperative that we put in place the best training program(s) available to ensure the long-term success for this business sector. Florida's Job Growth Grant Fund program is one such program that will enable FSW to create a customized training program to produce a workforce trained to meet their specific industry needs.

Please accept this letter of support on behalf of the Charlotte County Economic Development Office so that FSW can offer this unique training program for students interested in learning skills for employment opportunities for the community and region.

Best regards,

A handwritten signature in blue ink, appearing to read "Lucienne Pears", is written over a printed name and title.

Lucienne Pears
Director



THE FLORIDA SENATE

Tallahassee, Florida 32399-1100

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SENATOR KATHLEEN PASSIDOMO
28th District

August 22, 2017

To Whom It May Concern,

As part of the *Florida Job Growth Grant Fund* program, Florida SouthWestern State College (FSW) has applied for funding to assist in the startup costs of an FAA Airframe & Powerplant certification course at the Charlotte County Campus in Punta Gorda, Florida. This course, which will allow successful candidates to sit for their FAA certification, also provides pathways should the individual choose to continue into associate and baccalaureate levels of education.

I fully support FSW's application to the *Florida Job Growth Grant Fund* and recognize the value it will bring to the citizens of Charlotte County, and the entire five county service region of FSW. Graduates of this certification program will provide a ready workforce for aviation and other industries across all of Southwest Florida through a convenient and affordable program of education.

Commercial aviation will require an estimated 113,000 new technicians in North America alone over the next 20 years. This high-skill, high-wage job is among the industries identified in the General Appropriations Act (Line 125, pg. 36, LoF2017-70) as eligible for performance-based incentives for each certification earned by completers.

I request your favorable consideration of Florida SouthWestern State College's application. If I can be of further assistance, please contact me.

Respectfully,

A handwritten signature in black ink, appearing to read "K. Passidomo", with a horizontal line extending to the right.

Senator Kathleen C. Passidomo

REPLY TO

- ☐ 3299 East Tamiami Trail, Suite 203 Naples, Florida 34112 (239) 417-6205
- ☐ 25 East Hickpoochee Avenue, Room J-126, LaBelle, Florida 33935 (863) 674-7122
- ☐ 318 Senate Office Building, 404 South Monroe Street, Tallahassee, Florida 32399-1100 (850) 487-5028

Senate's Website www.flsenate.gov

JOE NEGRON
President of the Senate

ANITERE FLORES
President Pro Tempore



Florida House of Representatives

Representative Michael Grant

District 75

District Office:
4355 Pinnacle Street
Suite C
Charlotte Harbor, FL 33980
(941) 613-0914

Email: Michael.Grant@MyFloridaHouse.gov

Tallahassee Office:
1401 The Capitol
402 South Monroe Street
Tallahassee, FL 32399
(850) 717-5075

August 23, 2017

Mr. Peter Antonacci
Enterprise Florida, Inc., President & CEO
101 North Monroe Street, Suite 1000
Tallahassee, FL 32301

RE: Florida Job Growth Grant Fund Application

Dear President & CEO Antonacci:

I thoroughly support Florida SouthWestern State College's application to the Florida Job Growth Grant Fund. The financing would assist in the startup cost of an FAA Airframe & Powerplant certification course. This program will provide a ready workforce for skilled aviation, technology, and manufacturing jobs.

Arrays of opportunities are available for both those that complete the program and for Charlotte County. It would be a critical addition to the economic development base for the five county service region of FSW, comprised of Charlotte, Collier, Glades, Hendry, and Lee Counties.

The approval of this grant encompasses EFI's mission to expand and diversify the state's economy. By investing in our communities, educated workers are a key component of attracting successful companies and high-paying jobs. Please feel free to contact me, if you have any questions or if I may be of service. Your consideration is greatly appreciated.

Sincerely,

A handwritten signature in blue ink that reads "Michael J. Grant".

Michael J. Grant
State Representative, District 75

MJG/jb

Committees

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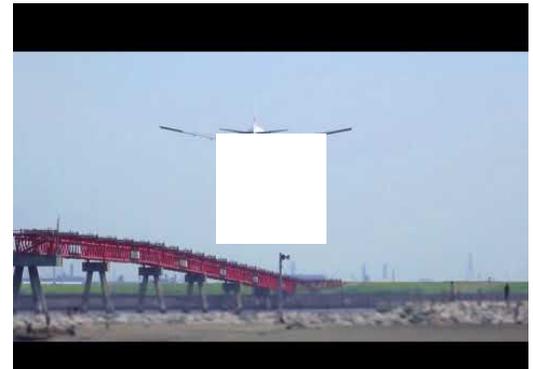
Occupational Outlook Handbook > Installation, Maintenance, and Repair >

Aircraft and Avionics Equipment Mechanics and Technicians

[EN ESPAÑOL](#)[PRINTER-FRIENDLY](#)[Summary](#)[What They Do](#)[Work Environment](#)[How to Become One](#)[Pay](#)[Job Outlook](#)[State & Area Data](#)[Similar Occupations](#)[More Info](#)

Summary

Quick Facts: Aircraft and Avionics Equipment Mechanics and Technicians	
2016 Median Pay	\$60,270 per year \$28.98 per hour
Typical Entry-Level Education	See How to Become One
Work Experience in a Related Occupation	None
On-the-job Training	None
Number of Jobs, 2016	149,500
Job Outlook, 2016-26	5% (As fast as average)
Employment Change, 2016-26	7,500



[What Aircraft and Avionics Equipment Mechanics and Technicians Do](#)

Aircraft and avionics equipment mechanics and technicians repair and perform scheduled maintenance on aircraft.

[Work Environment](#)

Aircraft and avionics equipment mechanics and technicians work in hangars, in repair stations, or on airfields. The environment can be loud because of aircraft engines and equipment.

[How to Become an Aircraft and Avionics Equipment Mechanic or Technician](#)

Most aircraft and avionics equipment mechanics and technicians learn their trade at an [Federal Aviation Administration](#) (FAA)-approved aviation maintenance technician school or on the job. Some learn through training received in the military.

[Pay](#)

The median annual wage for aircraft mechanics and service technicians was \$60,170 in May 2016.

The median annual wage for avionics technicians was \$60,760 in May 2016.

[Job Outlook](#)

Overall employment of aircraft and avionics equipment mechanics and technicians is projected to grow 5 percent from 2016 to 2026, about as fast as the average for all occupations. Job opportunities are expected to be good because there will be a need to replace those workers leaving the occupation.

[State & Area Data](#)

Explore resources for employment and wages by state and area for aircraft and avionics equipment mechanics and technicians.

[Similar Occupations](#)

Compare the job duties, education, job growth, and pay of aircraft and avionics equipment mechanics and technicians with similar occupations.

[More Information, Including Links to O*NET](#)

Learn more about aircraft and avionics equipment mechanics and technicians by visiting additional resources, including O*NET, a source on key characteristics of workers and occupations.

[What They Do ->](#)

SUGGESTED CITATION:

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Aircraft and Avionics Equipment Mechanics and Technicians, on the Internet at <https://www.bls.gov/ooh/installation-maintenance-and-repair/aircraft-and-avionics-equipment-mechanics-and-technicians.htm> (visited *October 30, 2017*).

Last Modified Date: Tuesday, October 24, 2017

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U.S. Bureau of Labor Statistics | Office of Occupational Statistics and Employment Projections, PSB Suite 2135, 2 Massachusetts Avenue, NE Washington, DC 20212-0001
www.bls.gov/ooh | Telephone: 1-202-691-5700 | [Contact OOH](#)

**Florida Department of Education
Curriculum Framework**

Program Title: Aviation Airframe Mechanics
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

PSAV – Career Preparatory	
Program Number	T640300
CIP Number	0647060703
Grade Level	30, 31
Standard Length	1,350 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.shtml
Basic Skills Level	Mathematics: 10 Language: 9 Reading: 10

Purpose

The purpose of this program is to prepare students for employment or advanced training in the commercial and general aviation industry. Instruction is designed to prepare students for Federal Aviation Administration (FAA) license examinations for Airframe ratings. Federal Aviation Regulation (FAR) Part 147 identifies minimum requirements for AMT schools. Any changes to the FAA-approved course content must be approved in advance. This program prepares students for employment as an Aviation Maintenance General Technician, and an Aviation Airframe Maintenance Technician.

This program focuses on broad, transferable skills, stresses understanding of all aspects of the aviation maintenance industry, and demonstrates elements of the industry such as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of two occupational completion points. The Aviation Maintenance General Technician (AMT0705) course is the core course.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3) (b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the PSAV program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	AMT0705	Aviation Maintenance General Technician	AIR MECH @7 7G	450 hours	49-3011
B	AMT0765	Aviation Maintenance Airframe Technician 1		450 hours	49-3011
	AMT0766	Aviation Maintenance Airframe Technician 2		450 hours	

National Standards

Industry or National Standards corresponding to the standards and/or benchmarks for the Aircraft Airframe Mechanics program can be found using the following link:

<http://www.gpo.gov/fdsys/pkg/CFR-2012-title14-vol3/pdf/CFR-2012-title14-vol3-part147-appC.pdf>

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Perform basic aircraft drawing skills.
- 02.0 Demonstrate aircraft weight and balance skills.
- 03.0 Perform ground operations and servicing duties.
- 04.0 Demonstrate mathematical skills.
- 05.0 Maintain forms and records.
- 06.0 Apply principles of basic physics.
- 07.0 Demonstrate the use of maintenance publications.
- 08.0 Demonstrate appropriate communication skills.
- 09.0 Demonstrate employability skills as an Aviation Maintenance General Technician.
- 10.0 Maintain aircraft fluid lines and fittings.
- 11.0 Perform aircraft materials and processes skills.
- 12.0 Perform cleaning and corrosion-control operations.
- 13.0 Perform basic electricity skills.
- 14.0 Interpret mechanic privileges and limitations.
- 15.0 Maintain wood structures.
- 16.0 Perform aircraft covering.
- 17.0 Apply aircraft finishes.
- 18.0 Repair sheet-metal and non-metallic structures.
- 19.0 Perform and identify proper welding.
- 20.0 Perform assembly and rigging.
- 21.0 Perform airframe inspection.
- 22.0 Maintain aircraft landing-gear systems.
- 23.0 Maintain hydraulic and pneumatic power systems.
- 24.0 Maintain cabin atmosphere control systems.
- 25.0 Maintain aircraft instrument systems.
- 26.0 Maintain communication and navigation systems.
- 27.0 Inspect and repair aircraft fuel systems.
- 28.0 Inspect and repair aircraft electrical systems.
- 29.0 Inspect and repair position and warning systems.
- 30.0 Maintain ice and rain control systems.
- 31.0 Inspect and repair aircraft fire-protection systems.
- 32.0 Demonstrate knowledge of Federal Aviation Administration Airframe licensing requirements.
- 33.0 Demonstrate employability skills for an Aviation Maintenance Airframe Technician (AMT) with an FAA Airframe rating.
- 34.0 Demonstrate an understanding of entrepreneurship related to opportunities in Aviation Airframe Maintenance occupations.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Airframe Mechanics
PSAV Number: T640300

Course Number: AMT0705
Occupational Completion Point: A
Aviation Maintenance General Technician – 450 Hours – SOC Code 49-3011

Course Description:

The Aviation Maintenance General Technician course prepares students for entry into the aviation industry. Students explore career opportunities and requirements of a professional aviation mechanic. Students study basic electricity, aircraft drawing, weight, balance, fluid lines, fittings, materials, processes, operations, services, cleaning, corrosion-control, math, forms, records, basic physics, maintenance publications, communication, and employability skills.

CTE Standards and Benchmarks	FAA FAR Part 147
01.0 Perform basic aircraft drawing skills--The student will be able to:	
01.01 Use aircraft drawings, symbols, and system schematics.	App. B, B, 7. Level 2
01.02 Draw sketches of repairs and alterations.	App. B, B, 8. Level 3
01.03 Use blueprint information.	App. B, B, 9. Level 3
01.04 Use graphs and charts.	App. B, B, 10. Level 3
02.0 Demonstrate aircraft weight and balance skills--The student will be able to:	
02.01 Weigh aircraft.	App. B, C, 11. Level 2
02.02 Perform complete weight-and-balance check and record data.	App. B, C, 12. Level 3
02.03 Properly configure aircraft for weighing and capable of setting up and using weighing equipment.	
03.0 Perform ground operations and servicing duties--The student will be able to:	
03.01 Start, ground operate, move, service, and secure aircraft and identify typical ground-operations hazards.	App. B, G, 20. Level 2
03.02 Identify and select fuels.	App. B, G, 21. Level 2
03.03 Comply with prescribed shop and personal safety procedures.	
04.0 Demonstrate mathematical skills--The student will be able to:	
04.01 Extract roots and raise numbers to a given power.	App. B, H, 24. Level 3

CTE Standards and Benchmarks	FAA FAR Part 147
04.02 Determine areas and volumes of various geometrical shapes by solving problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.	App. B, H, 25. Level 3
04.03 Solve ratio, proportion, and percentage problems.	App. B, H, 26. Level 3
04.04 Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	App. B, H, 27. Level 3
05.0 Maintain forms and records--The student will be able to:	
05.01 Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.	App. B, I, 28. Level 3
05.02 Complete required maintenance forms, records, and inspection reports.	App. B, I, 29. Level 3
06.0 Apply principles of basic physics--The student will be able to:	
06.01 Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight.	App. B, J, 30. Level 2
06.02 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.	
06.03 Draw conclusions or make inferences from data.	
06.04 Identify health-related problems that may result from exposure to work-related chemicals and hazardous materials and know the proper precautions required for handling such materials.	
06.05 Understand pressure measurement in terms of PSI, inches of mercury, and KPA.	
07.0 Demonstrate the use of maintenance publications--The student will be able to:	
07.01 Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.	App. B, K, 31. Level 3
07.02 Read technical data.	App. B, K, 32. Level 3
08.0 Demonstrate appropriate communication skills--The student will be able to:	
08.01 Write logical and understandable statements or phrases to accurately complete forms/invoices commonly used in business and industry.	
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.	
08.03 Read and follow written and oral instructions.	
08.04 Answer and ask questions coherently and concisely.	
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.	
08.06 Demonstrate appropriate telephone/communication skills.	
09.0 Demonstrate employability skills as an Aviation Maintenance General Technician--The student will be able to:	

CTE Standards and Benchmarks	FAA FAR Part 147
09.01 Conduct a job search.	
09.02 Secure information about a job.	
09.03 Identify documents that may be required when applying for a job position.	
09.04 Complete a job-application form correctly.	
09.05 Demonstrate job-interview skills.	
09.06 Identify appropriate responses to criticism from employer, supervisor, or other employees.	
09.07 Identify work habits for getting and keeping a job.	
09.08 Explain how to make job changes.	
09.09 Explain the purpose of the Federal Law as recorded in (29 CFR-1910.1200).	
10.0 Maintain aircraft fluid lines and fittings--The student will be able to:	
10.01 Fabricate and install rigid and flexible fluid lines and fittings.	App. B, D, 13. Level 3
10.02 Utilize proper personal safety procedures for fluid lines and fittings.	
11.0 Perform aircraft materials and processes skills--The student will be able to:	
11.01 Identify and select appropriate nondestructive testing methods.	App. B, E, 14. Level 1
11.02 Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections.	App. B, E, 15. Level 2
11.03 Perform basic heat-testing processes.	App. B, E, 16. Level 1
11.04 Identify and select aircraft hardware and materials.	App. B, E, 17. Level 3
11.05 Inspect and check welds.	App. B, E, 18. Level 3
11.06 Perform precision measurements.	App. B, E, 19. Level 3
11.07 Perform safety-wiring techniques.	
12.0 Perform cleaning and corrosion-control operations--The student will be able to:	
12.01 Identify and select cleaning materials.	App. B, G, 22. Level 3
12.02 Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning. Understand metal strength limitations when removing corrosion.	App. B, G, 23. Level 3
13.0 Perform basic electricity skills--The student will be able to:	
13.01 Calculate and measure capacitance and inductance.	App. B, A, 1. Level 2
13.02 Calculate and measure electrical power.	App. B, A, 2. Level 2
13.03 Measure voltage, current, resistance, and continuity.	App. B, A, 3. Level 3

CTE Standards and Benchmarks	FAA FAR Part 147
13.04 Determine the relationship of voltage, current, and resistance in electrical circuits.	App. B, A, 4. Level 3
13.05 Read and interpret aircraft electrical-circuit diagrams, including solid-state devices and logic functions.	App. B, A, 5. Level 3
13.06 Inspect and service batteries.	App. B, A, 6. Level 3
13.07 Utilize proper electrical safety procedures.	
14.0 Interpret mechanic privileges and limitations--The student will be able to:	
14.01 Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.	App. B, L, 33. Level 3
14.02 Identify the information in Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for Aviation Maintenance Technician (AMT) certification and ratings.	
14.03 Identify the FAA requirements that must be satisfied in order to display the FAA Airframe and Powerplant license.	

Florida Department of Education
Student Performance Standards

Course Number: AMT0765
Occupational Completion Point: B (1 of 2)
Aviation Maintenance Airframe Technician 1 – 450 Hours – SOC Code 49-3011

Course Description:

The Aviation Maintenance Airframe Technician 1 course is designed to build on the skills and knowledge students learned in the Aviation Maintenance General Technician course. Students explore career opportunities and requirements of a professional aviation mechanic. Students study wood structures, aircraft covering, finishes, metallic and non-metallic surfaces, basic welding, assembly, rigging, airframe inspection, landing gear, hydraulic and pneumatic systems, atmosphere control, aircraft instruments, communication, and navigation systems.

CTE Standards and Benchmarks	FAA FAR Part 147
15.0 Maintain wood structures--The student will be able to:	
15.01 Service and repair wood structures.	App. C, I, A, 1. Level 1
15.02 Identify wood defects.	App. C, I, A, 2. Level 1
15.03 Inspect wood structures.	App. C, I, A, 3. Level 1
16.0 Perform aircraft covering--The student will be able to:	
16.01 Select and apply fabric and fiberglass covering materials.	App. C, I, B, 4. Level 1
16.02 Inspect, test, and repair fabric and fiberglass.	App. C, I, B, 5. Level 1
17.0 Apply aircraft finishes--The student will be able to:	
17.01 Apply trim, letters, and touch-up paint.	App. C, I, C, 6. Level 1
17.02 Identify and select aircraft finishing materials.	App. C, I, C, 7. Level 2
17.03 Apply finishing materials.	App. C, I, C, 8. Level 2
17.04 Inspect finishes and identify defects.	App. C, I, C, 9. Level 2
17.05 Demonstrate an understanding of common safety practices dealing with paints and solvents.	
18.0 Repair sheet-metal and non-metallic structures--The student will be able to:	
18.01 Select, install, and remove special fasteners for metallic, bonded, and composite structures.	App. C, I, D, 10. Level 2
18.02 Inspect bonded structures.	App. C, I, D, 11. Level 2
18.03 Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	App. C, I, D, 12. Level 2

CTE Standards and Benchmarks	FAA FAR Part 147
18.04 Inspect, check, service, and repair windows, doors, and interior furnishings.	App. C, I, D, 13. Level 2
18.05 Inspect and repair sheet-metal structures.	App. C, I, D, 14. Level 3
18.06 Install conventional rivets.	App. C, I, D, 15. Level 3
18.07 Form, lay out, and bend sheet metal.	App. C, I, D, 16. Level 3
19.0 Perform and identify proper welding--The student will be able to:	
19.01 Weld magnesium and titanium.	App. C, I, E, 17. Level 1
19.02 Solder stainless steel.	App. C, I, E, 18. Level 1
19.03 Fabricate tubular structures.	App. C, I, E, 19. Level 1
19.04 Solder, braze, gas-weld, and arc-weld steel.	App. C, I, E, 20. Level 2
19.05 Weld aluminum and stainless steel.	App. C, I, E, 21. Level 1
20.0 Perform assembly and rigging--The student will be able to:	
20.01 Rig rotary-wing aircraft.	App. C, I, F, 22. Level 1
20.02 Rig fixed-wing aircraft.	App. C, I, F, 23. Level 2
20.03 Check alignment of structures.	App. C, I, F, 24. Level 2
20.04 Assemble aircraft components, including flight control surfaces.	App. C, I, F, 25. Level 3
20.05 Balance, rig, and inspect movable primary and secondary flight control structures.	App. C, I, F, 26. Level 3
20.06 Jack aircraft.	App. C, I, F, 27. Level 3
21.0 Perform airframe inspection--The student will be able to:	
21.01 Perform aircraft conformity and airworthiness inspections.	App. C, I, G, 28. Level 3
22.0 Maintain aircraft landing gear systems--The student will be able to:	
22.01 Inspect, check, service, and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems.	App. C, II, A, 29. Level 3
22.02 Utilize proper safety procedures and equipment when working on aircraft with electrical or hydraulic power on.	
22.03 Utilize proper safety procedures when working on landing gear struts or wheel and tire assemblies.	
23.0 Maintain hydraulic and pneumatic power systems--The student will be able to:	
23.01 Repair hydraulic and pneumatic power system components.	App. C, II, B, 30. Level 2
23.02 Identify and select hydraulic fluids.	App. C, II, B, 31. Level 3
23.03 Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems.	App. C, II, B, 32. Level 3

CTE Standards and Benchmarks		FAA FAR Part 147
24.0	Maintain cabin atmosphere control systems--The student will be able to:	
24.01	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, pressurization systems, and air-cycle machines.	App. C, II, C, 33. Level 1
24.02	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems.	App. C, II, C, 34. Level 1
24.03	Inspect, check, troubleshoot, service and repair oxygen systems.	App. C, II, C, 35. Level 2
25.0	Maintain aircraft instrument systems--The student will be able to:	
25.01	Inspect, check, service, troubleshoot, and repair electronic flight-instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure, and position-indicating systems to include the use of built-in test equipment.	App. C, II, D, 36. Level 1
25.02	Install instruments and perform a static pressure-system leak test.	App. C, II, D, 37. Level 2
26.0	Maintain communication and navigation systems--The student will be able to:	
26.01	Inspect, check, and troubleshoot autopilot, servos, and approach coupling systems.	App. C, II, E, 38. Level 1
26.02	Inspect, check, and service aircraft electronic communication and navigation systems, including VHF passenger address interphones and static-discharge devices, aircraft VOR, ILS, LORAN, radar beacon transponders, flight-management computers, and GPWS.	App. C, II, E, 39. Level 1
26.03	Inspect and repair antenna and electronic equipment installations.	App. C, II, E, 40. Level 2

Course Number: AMT0766

Occupational Completion Point: B (2 of 2)

Aviation Maintenance Airframe Technician 2 – 450 Hours – SOC Code 49-3011

Course Description:

The Aviation Maintenance Airframe Technician 2 course is designed to build on the skills and knowledge students learned in the Aviation Maintenance Airframe Technician 1 course. Students explore career opportunities and requirements of a professional aviation mechanic. Students study aircraft fuel, electrical, position, warning, ice and rain control, fire-protection, FAA Airframe licensing requirements, employability skills, and entrepreneurship.

CTE Standards and Benchmarks		FAA FAR Part 147
27.0	Inspect and repair aircraft fuel systems--The student will be able to:	
27.01	Check and service fuel-dump systems	App. C, II, F, 41. Level 1
27.02	Perform fuel-management transfer, re-fueling, and de-fueling	App. C, II, F, 42. Level 1
27.03	Inspect, check, and repair pressure fuel systems	App. C, II, F, 43. Level 1

CTE Standards and Benchmarks	FAA FAR Part 147
27.04 Repair aircraft fuel-system components.	App. C, II, F, 44. Level 2
27.05 Inspect and repair fluid quantity-indicating systems.	App. C, II, F, 45. Level 2
27.06 Troubleshoot, service, and repair fluid pressure and temperature warning systems.	App. C, II, F, 46. Level 2
27.07 Inspect, check, service, troubleshoot, and repair aircraft fuel systems.	App. C, II, F, 47. Level 3
28.0 Inspect and repair aircraft electrical systems--The student will be able to:	
28.01 Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors.	App. C, II, G, 48. Level 2
28.02 Install, check, and service airframe electric wiring, controls, switches, indicators, and protective devices.	App. C, II, G, 49. Level 3
28.03 Inspect, check, troubleshoot, service, and repair alternating and direct current electrical systems.	App. C, II, G, 50a. Level 3
28.04 Inspect, check, and troubleshoot constant and integrated speed- drive generators.	App. C, II, G, 50b. Level 1
29.0 Inspect and repair position and warning systems--The student will be able to:	
29.01 Inspect, check, and service speed and configuration warning systems, electrical brake controls, and antiskid systems.	App. C, II, H, 51. Level 2
29.02 Inspect, check, troubleshoot, and service landing gear position- indicating and warning systems.	App. C, II, H, 52. Level 3
30.0 Maintain ice and rain control systems--The student will be able to:	
30.01 Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.	App. C, II, I, 53. Level 2
31.0 Inspect and repair aircraft fire-protection systems--The student will be able to:	
31.01 Inspect, check, and service smoke and carbon monoxide detection systems.	App. C, II, J, 54. Level 1
31.02 Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems.	App. C, II, J, 55. Level 3
32.0 Demonstrate knowledge of Federal Aviation Administration Airframe licensing requirements--The student will be able to:	
32.01 Explain the requirements for obtaining FAA authorization to take the FAA Airframe examinations.	
33.0 Demonstrate employability skills for an Aviation Maintenance Airframe Technician (AMT) with an FAA Airframe rating --The student will be able to:	
33.01 Conduct a job search for an AMT with FAA Airframe rating position.	
33.02 Secure information about the requirements for an AMT with FAA Airframe rating in a particular firm.	
33.03 Identify documents that may be required when applying for an AMT with FAA Airframe rating position.	
33.04 Complete a job-application form correctly.	
33.05 Demonstrate competency in job-interview techniques.	

CTE Standards and Benchmarks	FAA FAR Part 147
33.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.	
33.07 Identify or adopt acceptable work habits.	
33.08 Demonstrate knowledge of how to make job changes appropriately.	
33.09 Demonstrate acceptable employee health habits.	
33.10 Demonstrate knowledge of the Federal Law as recorded in (29 CFR-1910.1200).	
34.0 Demonstrate an understanding of entrepreneurship related opportunities in Aviation Airframe Maintenance occupations--The student will be able to:	
34.01 Define entrepreneurship.	
34.02 Describe the importance of entrepreneurship to Aviation Airframe Maintenance occupations.	
34.03 List the advantages and disadvantages of Aviation Airframe Maintenance business ownership.	
34.04 Identify the risks involved in ownership of an Aviation Airframe Maintenance business.	
34.05 Identify the necessary personal characteristics of a successful Aviation Airframe Maintenance business owner.	
34.06 Identify the business skills needed to operate an Aviation Airframe Maintenance business efficiently and effectively.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Classroom, shop, and laboratory activities are an integral part of this program. FAR Section 147.21(e) requires teaching of at least 50 percent of the curriculum in the shop or laboratory. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes found in the industry. Equipment and supplies should be provided to enhance hands-on experiences for students in the chosen occupation.

Special Notes

Required FAA exams include GENERAL written, oral, and practical; AIRFRAME written, oral, and practical; and POWERPLANT written, oral, and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take precedence over other requirements. The FAA specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

"FAA FAR Part 147" identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

- Level 1:** knowledge of general principles
- Level 2:** knowledge of general principles and limited practical application
- Level 3:** knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147: For subjects taught at Level 3, all special tools required to meet "return to service" standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation.

All tools and equipment should be maintained in good working order and be in a condition for safe operation. The types of tools and equipment required for Aviation General, Airframe, and Powerplant teaching include the ones listed below:

Common hand tools, portable tools, precision tools, machine tools, torqueing tools, shop equipment and machinery, specialized tools and equipment, airframe structures, aircraft, airframes, powerplants, propellers, and components of this equipment

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student. Access MyCareerShines by visiting: www.mycareershines.org.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 9.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:

<http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml>

Florida Department of Education
Curriculum Framework

Program Title: Aviation Maintenance Management
Career Cluster: Transportation, Distribution and Logistics

AS	
CIP Number	1649010401
Program Type	College Credit
Standard Length	83 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to the Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) examinations for aviation maintenance powerplant and airframe technician certification as prescribed by FAR 147. The program content should also include training in communication, management leadership, human relations, supervisory and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 83 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Perform basic electricity skills.
- 02.0 Perform basic aircraft drawing skills.
- 03.0 Demonstrate aircraft weight and balance skills.
- 04.0 Maintain aircraft fluid lines and fittings.
- 05.0 Perform aircraft materials and process skills.
- 06.0 Perform ground operations and servicing duties.
- 07.0 Perform cleaning and corrosion control operations.
- 08.0 Demonstrate mathematics skills.
- 09.0 Maintain forms and records.
- 10.0 Apply principles of basic physics.
- 11.0 Demonstrate the use of maintenance publications.
- 12.0 Interpret mechanic privileges.
- 13.0 Perform basic reciprocating engine skills.
- 14.0 Perform basic turbine engine skills.
- 15.0 Perform engine inspection.
- 16.0 Maintain engine instrument systems.
- 17.0 Maintain engine fire protection systems.
- 18.0 Maintain engine electrical systems.
- 19.0 Maintain lubrication systems.
- 20.0 Maintain ignition systems.
- 21.0 Maintain fuel metering systems.
- 22.0 Maintain engine fuel systems.
- 23.0 Maintain induction and engine airflow systems.
- 24.0 Maintain engine cooling systems.
- 25.0 Maintain engine exhaust systems.
- 26.0 Maintain aircraft propellers.
- 27.0 Maintain unducted fans.
- 28.0 Maintain auxiliary power units
- 29.0 Maintain wood structures.
- 30.0 Perform aircraft covering.
- 31.0 Apply aircraft finishes.
- 32.0 Repair sheetmetal structures.
- 33.0 Perform aircraft welding.
- 34.0 Perform airframe assembly and rigging.
- 35.0 Perform airframe inspection.
- 36.0 Maintain aircraft landing gear systems.
- 37.0 Maintain hydraulic and pneumatic power systems.
- 38.0 Maintain cabin atmosphere control systems.

- 39.0 Maintain aircraft instrument systems.
- 40.0 Maintain communication and navigation systems.
- 41.0 Inspect and repair aircraft fuel systems.
- 42.0 Inspect or repair aircraft electrical systems.
- 43.0 Inspect and repair position and warning systems.
- 44.0 Maintain ice and rain control systems.
- 45.0 Inspect and repair aircraft fire protection systems.
- 46.0 Demonstrate knowledge of FAA aircraft mechanic licensing requirements.
- 47.0 Demonstrate the human relations skills necessary for success in supervision.
- 48.0 Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.
- 49.0 Demonstrate a practical approach to job management.
- 50.0 Demonstrate appropriate communication skills.
- 51.0 Demonstrate employability skills.
- 52.0 Demonstrate an understanding of computer skills.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Maintenance Management
CIP Numbers: 1649010401
Program Length: 83 credit hours
SOC Code(s): 49-3011

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. At the completion of this program, the student will be able to:	FAA FAR Part 147
01.0 Perform basic electricity skills--The student will be able to:	
01.01 Calculate and measure capacitance and inductance.	App. B, A, 1. Level 2
01.02 Calculate and measure electrical power.	App. B, A, 2. Level 2
01.03 Measure voltage, current, resistance, and continuity.	App. B, A, 3. Level 3
01.04 Determine the relationship of voltage, current, and resistance in electrical circuits.	App. B, A, 4. Level 3
01.05 Read and interpret aircraft electrical-circuit diagrams, including solid-state devices and logic functions.	App. B, A, 5. Level 3
01.06 Inspect and service batteries.	App. B, A, 6. Level 3
01.07 Utilize proper electrical safety procedures.	
01.08 Troubleshoot electrical systems.	
02.0 Perform basic aircraft drawing skills--The student will be able to:	
02.01 Use aircraft drawings, symbols, and system schematics.	App. B, B, 7. Level 2
02.02 Draw sketches of repairs and alterations.	App. B, B, 8. Level 3
02.03 Use blueprint information.	App. B, B, 9. Level 3
02.04 Use graphs and charts.	App. B, B, 10. Level 3
03.0 Demonstrate aircraft weight and balance skills--The student will be able to:	
03.01 Weigh aircraft.	App. B, C, 11. Level 2
03.02 Perform complete weight-and-balance check and record data.	App. B, C, 12. Level 3
04.0 Maintain aircraft fluid lines and fittings--The student will be able to:	
04.01 Fabricate and install rigid and flexible fluid lines and fittings.	App. B, D, 13. Level 3
05.0 Perform aircraft materials and processes skills--The student will be able to:	

05.01	Identify and select appropriate nondestructive testing methods.	App. B, E, 14. Level 1
05.02	Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections.	App. B, E, 15. Level 2
05.03	Perform basic heat-treating processes.	App. B, E, 16. Level 1
05.04	Identify and select aircraft hardware and materials.	App. B, E, 17. Level 3
05.05	Inspect and check welds.	App. B, E, 18. Level 3
05.06	Perform precision measurements.	App. B, E, 19. Level 3
05.07	Perform safety wiring techniques.	
06.0	Perform ground operations and servicing duties--The student will be able to:	
06.01	Start, ground operate, move, service, and secure aircraft and identify typical ground-operations hazards.	App. B, F, 20. Level 2
06.02	Identify and select fuels.	App. B, F, 21. Level 2
06.03	Comply with prescribed shop and personal safety procedures.	
07.0	Perform cleaning and corrosion control operations--The student will be able to:	
07.01	Identify and select cleaning materials.	App. B, G, 22. Level 3
07.02	Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning.	App. B, G, 23. Level 3
07.03	Identify and utilize appropriate equipment for cleaning and corrosion control.	
07.04	Observe appropriate personal safety procedures for corrosive chemicals.	
08.0	Demonstrate mathematical skills--The student will be able to:	
08.01	Extract roots and raise numbers to a given power.	App. B, H, 24. Level 3
08.02	Determine areas and volumes of various geometrical shapes by solving problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.	App. B, H, 25. Level 3
08.03	Solve ratio, proportion, and percentage problems.	App. B, H, 26. Level 3
08.04	Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	App. B, H, 27. Level 3
08.05	Solve linear inequalities in one variable and applied problems.	
08.06	Factor polynomials.	
08.07	Simplify algebraic fractions, complex fractions and solve rational and literal equations and applied problems.	
08.08	Determine areas and volumes of various geometrical shapes.	
08.09	Solve ratio, proportion, and percentage problems.	
08.10	Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	

08.11	Graph linear equations and inequalities in two variables and solve graph systems of linear equations and inequalities in two variables.	
08.12	Solve and graph quadratic equations and inequalities with real solutions and solve related word problems.	
08.13	Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.	
08.14	Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.	
08.15	Add, subtract, multiply and divide using fractions, decimals, and whole numbers.	
08.16	Determine the correct purchase price, to include sales tax, for a materials list containing a minimum of six items.	
08.17	Demonstrate an understanding of federal, state and local taxes and their computation.	
09.0	Maintain forms and records--The student will be able to:	
09.01	Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.	App. B, I, 28. Level 3
09.02	Complete required maintenance forms, records, and inspection reports.	App. B, I, 29. Level 3
10.0	Apply principles of basic physics--The student will be able to:	
10.01	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight.	App. B, J, 30. Level 2
10.02	Understand molecular action as a result of temperature extremes, chemical reactions, and moisture content.	
10.03	Draw conclusions or make inferences from data.	
10.04	Identify health-related problems which may result from exposure to work-related chemicals and hazardous materials, and know the proper precautions required for handling such materials.	
10.05	Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.	
11.0	Demonstrate the use of maintenance publications--The student will be able to:	
11.01	Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.	App. B, K, 31. Level 3
11.02	Read technical data.	App. B, K, 32. Level 3
12.0	Interpret mechanic privileges--The student will be able to:	
12.01	Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.	App. B, L, 33. Level 3
13.0	Perform basic reciprocating engine skills--The student will be able to:	
13.01	Inspect and repair a radial engine.	App. D, I, A, 1. Level 1
13.02	Overhaul reciprocating engine.	App. D, I, A, 2. Level 2

13.03	Inspect, check, service, and repair reciprocating engines and engine installations.	App. D, I, A, 3. Level 3
13.04	Install, troubleshoot, and remove reciprocating engines.	App. D, I, A, 4. Level 3
14.0	Perform basic turbine engine skills--The student will be able to:	
14.01	Overhaul turbine engine.	App. D, I, B, 5. Level 2
14.02	Inspect, check, service, and repair turbine engines and turbine engine installations.	App. D, I, B, 6. Level 3
14.03	Install, troubleshoot, and remove turbine engines.	App. D, I, B, 7. Level 3
15.0	Perform engine inspection--The student will be able to:	
15.01	Perform powerplant conformity and air worthiness inspections.	App. D, I, C, 8. Level 3
16.0	Maintain engine instrument systems--The student will be able to:	
16.01	Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems.	App. D, II, A, 9. Level 2
16.02	Inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and r.p.m. indicating systems.	App. D, II, A, 10. Level 2
17.0	Maintain engine fire protection systems--The student will be able to:	
17.01	Inspect, check service, troubleshoot, and repair engine fire detection and extinguishing systems.	App. D, II, B, 11. Level 3
18.0	Maintain engine electrical systems--The student will be able to:	
18.01	Repair engine electrical system components.	App. D, II, C, 12. Level 2
18.02	Install, check and service engine electrical wiring, controls, indicators, and protective devices.	App. D, II, C, 13. Level 3
19.0	Maintain lubrication systems--The student will be able to:	
19.01	Identify and select lubricants.	App. D, II, D, 14. Level 2
19.02	Repair engine lubrication system components.	App. D, II, D, 15. Level 2
19.03	Inspect, check, service, troubleshoot, and repair engine lubrication system.	App. D, II, D, 16. Level 3
20.0	Maintain ignition systems--The student will be able to:	
20.01	Overhaul magneto and ignition harness.	App. D, II, E, 17. Level 2
20.02	Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components.	App. D, II, E, 18. Level 2
20.03	Inspect, service, troubleshoot, and repair turbine engine electrical starting systems.	App. D, II, E, 19a. Level 3
21.0	Maintain fuel metering systems--The student will be able to:	
21.01	Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls.	App. D, II, F, 20. Level 1
21.02	Overhaul carburetor.	App. D, II, F, 21. Level 1
21.03	Repair engine fuel metering system components.	App. D, II, F, 22. Level 2

21.04	Inspect, check, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.	App. D, II, F, 23. Level 3
22.0	Maintain engine fuel systems--The student will be able to:	
22.01	Repair engine fuel system components.	App. D, II, G, 24. Level 2
22.02	Inspect, check, service, troubleshoot, and repair engine fuel systems.	App. D, II, G, 25. Level 3
23.0	Maintain induction and engine airflow systems --The student will be able to:	
23.01	Inspect, check, troubleshoot, service and repair engine ice and rain control systems.	App. D, II, H, 26. Level 2
23.02	Inspect, check, service, troubleshoot and repair heat exchangers, superchargers and turbine engine airflow and temperature control systems.	App. D, II, H, 27. Level 1
23.03	Inspect, check, service, and repair carburetor air intake and induction manifolds.	App. D, II, H, 28. Level 3
24.0	Maintain engine cooling systems--The student will be able to:	
24.01	Repair engine cooling system components.	App. D, II, I, 29. Level 2
24.02	Inspect, check, troubleshoot, service and repair engine cooling systems.	App. D, II, I, 30. Level 3
25.0	Maintain engine exhaust systems--The student will be able to:	
25.01	Repair engine exhaust system components.	App. D, II, J, 31. Level 2
25.02	Inspect, check, troubleshoot, service and repair engine exhaust systems.	App. D, II, J, 32a. Level 3
25.03	Troubleshoot and repair engine thrust reverser systems and related components.	App. D, II, J, 32b. Level 1
26.0	Maintain aircraft propellers--The student will be able to:	
26.01	Inspect, check, service and repair propeller synchronizing and ice control systems.	App. D, II, K, 33. Level 1
26.02	Identify and select propeller lubricants.	App. D, II, K, 34. Level 2
26.03	Balance propellers.	App. D, II, K, 35. Level 1
26.04	Repair propeller control system components.	App. D, II, K, 36. Level 2
26.05	Inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers, and propeller governing systems.	App. D, II, K, 37. Level 3
26.06	Install, troubleshoot and remove propellers.	App. D, II, K, 38. Level 3
26.07	Repair aluminum alloy propeller blades.	App. D, II, K, 39. Level 3
27.0	Maintain Unducted Fans-The student will be able to:	
27.01	Inspect and troubleshoot unducted fan systems and components.	App. D, II, L, 40. Level 1
28.0	Maintain Auxiliary Power Units-The student will be able to:	
28.01	Inspect, check, service, and troubleshoot turbine-driven auxiliary power units.	
29.0	Maintain wood structures--The student will be able to:	

29.01	Service and repair wood structures.	App. C, I, A, 1. Level 1
29.02	Identify wood defects.	App. C, I, A, 2. Level 1
29.03	Inspect wood structures.	App. C, I, A, 3. Level 1
30.0	Perform aircraft covering--The student will be able to:	
30.01	Select and apply fabric and fiberglass covering materials.	App. C, I, B, 4. Level 1
30.02	Inspect, test and repair fabric and fiberglass.	App. C, I, B, 5. Level 1
31.0	Apply aircraft finishes--The student will be able to:	
31.01	Apply trim, letters and touch-up paint.	App. C, I, C, 6. Level 1
31.02	Identify and select aircraft finishing materials.	App. C, I, C, 7. Level 2
31.03	Apply finishing materials.	App. C, I, C, 8. Level 2
31.04	Inspect finishes and identify defects.	App. C, I, C, 9. Level 2
31.05	Demonstrate an understanding of common safety practices dealing with paints and solvents.	
32.0	Repair sheet metal structures--The student will be able to:	
32.01	Select, install, and remove special fasteners for metallic, bonded, and composite structures.	App. C, I, D, 10. Level 2
32.02	Inspect bonded structures.	App. C, I, D, 11. Level 2
32.03	Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	App. C, I, D, 12. Level 2
32.04	Inspect, check, service, and repair windows, doors, and interior furnishings.	App. C, I, D, 13. Level 2
32.05	Inspect and repair sheet-metal structures.	App. C, I, D, 14. Level 3
32.06	Install conventional rivets.	App. C, I, D, 15. Level 3
32.07	Form, lay out, and bend sheet metal.	App. C, I, D, 16. Level 3
33.0	Perform aircraft welding--The student will be able to:	
33.01	Weld magnesium and titanium.	App. C, I, E, 17. Level 1
33.02	Solder stainless steel.	App. C, I, E, 18. Level 1
33.03	Fabricate tubular structures.	App. C, I, E, 19. Level 1
33.04	Solder, braze, gas-weld and arc-weld steel.	App. C, I, E, 20. Level 2
33.05	Weld aluminum and stainless steel.	App. C, I, E, 21. Level 1
34.0	Perform airframe assembly and rigging--The student will be able to:	
34.01	Rig rotary-wing aircraft.	App. C, I, F, 22. Level 1

34.02	Rig fixed-wing aircraft.	App. C, I, F, 23. Level 2
34.03	Check alignment of structures.	App. C, I, F, 24. Level 2
34.04	Assemble aircraft components, including flight control surfaces.	App. C, I, F, 25. Level 3
34.05	Balance, rig, and inspect movable primary and secondary flight control surfaces.	App. C, I, F, 26. Level 3
34.06	Jack aircraft.	App. C, I, F, 27. Level 3
35.0	Perform airframe inspection--The student will be able to:	
35.01	Perform conformity and airworthiness inspections.	App. C, I, G, 28. Level 3
36.0	Maintain aircraft landing gear systems--The student will be able to:	
36.01	Inspect, check, service, and repair landing gear, retraction systems, shock struts, bakes, wheels, tires, and steering systems.	App. C, II, A, 29. Level 3
36.02	Utilize proper safety procedures and equipment when working on aircraft with electrical or hydraulic power on.	
36.03	Utilize proper safety procedures when working on landing gear struts or wheel and tire assemblies.	
37.0	Maintain hydraulic and pneumatic power systems--The student will be able to:	
37.01	Repair hydraulic and pneumatic power system components.	App. C, II, B, 30. Level 2
37.02	Identify and select hydraulic fluids.	App. C, II, B, 31. Level 3
37.03	Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems.	App. C, II, B, 32. Level 3
38.0	Maintain cabin atmosphere control systems--The student will be able to:	
38.01	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, pressurization systems, and air cycle machines.	App. C, II, C 33. Level 1
38.02	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems.	App. C, II, C 34. Level 1
38.03	Inspect, check, troubleshoot, service and repair oxygen systems.	App. C, II, C 35. Level 2
39.0	Maintain aircraft instrument systems--The student will be able to:	
39.01	Inspect, check, service, troubleshoot and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure , and position indicating systems to include the use of built-in test equipment.	App. C, II, D, 36. Level 1
39.02	Install instruments and perform a static pressure system leak test	App. C, II, D, 37. Level 2
40.0	Maintain communication and navigation systems--The student will be able to:	
40.01	Inspect, check, and troubleshoot autopilot servos and approach coupling systems.	App. C, II, E, 38. Level 1
40.02	Inspect, check, and service aircraft electronic communications and navigation systems, including VHF, ILS, LORAN, Radar beacon transponders, flight management computers, and GPWS.	App. C, II, E, 39. Level 1
40.03	Inspect and repair antenna and electronic equipment installations.	App. C, II, E, 40. Level 2

41.0	Inspect and repair aircraft fuel systems--The student will be able to:	
41.01	Check and service fuel dump systems.	App. C, II, F, 41. Level 1
41.02	Perform fuel management, transfer and defueling.	App. C, II, F, 42. Level 1
41.03	Inspect, check and repair pressure fueling systems.	App. C, II, F, 43. Level 1
41.04	Repair aircraft fuel system components.	App. C, II, F, 44. Level 2
41.05	Inspect and repair fluid quantity indicating systems.	App. C, II, F, 45. Level 2
41.06	Troubleshoot, service and repair fluid and temperature warning systems.	App. C, II, F, 46. Level 2
41.07	Inspect, check, service, troubleshoot and repair aircraft fuel systems.	App. C, II, F, 47. Level 3
42.0	Inspect and repair aircraft electrical systems--The student will be able to:	
42.01	Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors.	App. C, II, G, 48. Level 2
42.02	Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.	App. C, II, G, 49. Level 2
42.03	Inspect, check, troubleshoot, service and repair alternating and direct current electrical systems.	App. C, II, G, 50a. Level 3
42.04	Inspect, check, and troubleshoot constant speed and integrated speed drive generators.	App. C, II, G, 50b. Level 1
43.0	Inspect and repair position and warning systems--The student will be able to:	
43.01	Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems.	App. C, II, H, 51. Level 2
43.02	Inspect, check, troubleshoot, and service landing gear position indicating and warning systems.	App. C, II, H, 52. Level 3
44.0	Maintain ice and rain control systems--The student will be able to:	
44.01	Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.	App. C, II, I, 53. Level 2
45.0	Inspect and repair aircraft fire protection systems--The student will be able to:	
45.01	Inspect, check and service smoke and carbon monoxide detection systems.	App. C, II, J, 54. Level 1
45.02	Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems.	App. C, II, J, 55. Level 3
46.0	Demonstrate knowledge of FAA aircraft mechanic licensing requirements--The student will be able to:	
46.01	Successfully complete the FAA powerplant written, oral and practical examinations.	
46.02	Display an FAA powerplant Mechanic's certificate.	
46.03	Successfully complete the FAA airframe written, oral and practical examinations.	
46.04	Display an FAA airframe mechanic's certificate.	
47.0	Demonstrate the human relations skills necessary for success in supervision--The student will be able to:	

47.01	Exhibit the ability to get along with others.	
47.02	Discuss the importance of human relations.	
47.03	Develop and demonstrate the unique human relations skills needed for successful job attainment and progress in supervising others.	
48.0	Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance--The student will be able to:	
48.01	Describe leadership theory and its complexity.	
48.02	Discuss how a new supervisor is introduced to leadership responsibilities.	
48.03	Identify the legal and social environment for supervision.	
48.04	Discuss pertinent legislation and the role of government intervention.	
48.05	Describe problems in union and non-union organizations.	
49.0	Demonstrate a practical approach to job management--The student will be able to:	
49.01	Assume responsibility in planning and coordinating resources.	
49.02	Demonstrate effective decision making and problem-solving techniques.	
49.03	Implement methods of work improvement.	
50.0	Demonstrate appropriate communication skills--The student will be able to:	
50.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.	
50.02	Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.	
50.03	Read and follow written and oral instructions.	
50.04	Answer and ask questions coherently and concisely.	
50.05	Read critically by recognizing assumptions and implications and by evaluating ideas.	
50.06	Demonstrate appropriate telephone/communication skills.	
50.07	Describe the importance of clear and concise writing.	
50.08	Demonstrate proficiency in the effective use of speech and vocabulary.	
50.09	Explain the importance of good listening skills.	
50.10	Discuss the role communication plays in management.	
50.11	Demonstrate the components of the communication process.	
50.12	Demonstrate effective written communication skills.	
50.13	Demonstrate effective oral communication skills.	

50.14	Write technical reports.	
51.0	Demonstrate employability skills--The student will be able to:	
51.01	Conduct a job search.	
51.02	Secure information about a job.	
51.03	Identify documents which may be required when applying for a job.	
51.04	Complete a job application form correctly.	
51.05	Demonstrate competence in job interview techniques.	
51.06	Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.	
51.07	Identify acceptable work habits.	
51.08	Demonstrate knowledge of how to make appropriate job changes.	
51.09	Demonstrate acceptable employee health and grooming habits.	
51.10	Exhibit punctuality, initiative, courtesy, loyalty and honesty.	
51.11	Demonstrate knowledge of the Federal as recorded in (29 CFR-1910.1200).	
52.0	Demonstrate an understanding of computer skills--The student will be able to:	
52.01	Demonstrate use of spreadsheets, databases and word processing.	
52.02	Demonstrate use of Internet including locating information, copying and printing web-based information.	
52.03	Demonstrate general knowledge of computer components.	
52.04	Demonstrate the location and use of antivirus capability.	
52.05	Demonstrate the ability to communicate by e-mail.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

The purpose of this program is to prepare students for employment as aircraft mechanics (SOC 49-3011), aircraft maintenance supervisors, or aviation maintenance managers. Graduates will be eligible to pursue FAA certification as airframe and powerplant mechanics and will be trained to troubleshoot maintenance problems and supervise mechanics in the aviation industry. This program also provides supplemental training for persons previously or currently employed in this occupation.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Aviation industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues. Since 83 credit hours are required in this curriculum, two summer terms will probably be required to complete the program within two years. Consideration should be given to making one or both summer terms a hands-on cooperative work experience for 5 credit hours.

An important note to consider is that each FAR PART 147 school must be approved by the FAA before any students can be placed in the program.

Required FAA exams include GENERAL written, oral, and practical; AIRFRAME written, oral, and practical; and POWERPLANT written, oral and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take precedence over other requirements. The FAA specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

“FAA FAR Part 147” identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

Level 1: knowledge of general principles

Level 2: knowledge of general principles and limited practical application

Level 3: knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147:

For subjects taught at Level 3, all special tools required to meet “return to service” standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation. All tools and equipment should be maintained in good working order and be in a condition for safe operation. The types of tools and equipment required for Aviation General, Airframe, and Powerplant teaching include the ones listed below: Common hand tools, portable tools, precision tools, machine tools, torsion tools, shop equipment and machinery, specialized tools and equipment, airframe structures, aircraft, airframes, powerplants, propellers, and components of this equipment.

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:

<http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml>



Extraordinary demand for pilots, technicians, and cabin crew

As global economies expand and airlines take delivery of tens of thousands of new commercial jetliners over the next 20 years, there is extraordinary demand for people to fly and maintain these airplanes. To meet this tremendous growth, the 2016 Boeing Pilot and Technician Outlook forecasts that between now and 2035, the aviation industry will need to supply more than two million new aviation personnel—617,000 commercial airline pilots, 679,000 maintenance technicians, and 814,000 cabin crew.

Meeting this demand will require innovative solutions — focused on educational outreach and career pipeline programs — to inspire the next generation of pilots, technicians, and cabin crew. New technologies, devices, and training methods will be needed to meet a wide range of learning styles. The growing diversity of aviation personnel will also require instructors to have cross-cultural and cross-generational skills to engage tomorrow's workforce.

Economic expansion fueling aviation growth

Airlines across the globe are expanding their fleets and flight schedules to satisfy demand generated by global economic expansion. The aviation industry continues to address these challenges by creating balanced, sustainable solutions to fill future pilot pipelines.

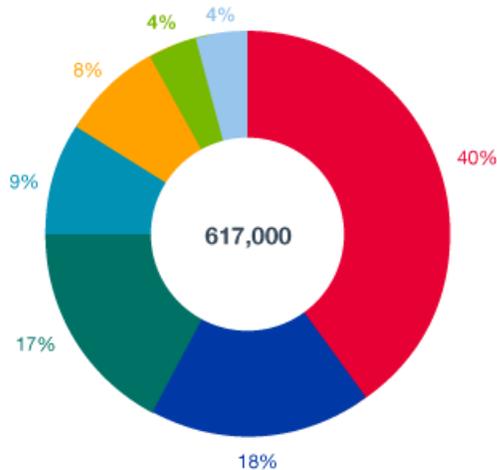
Although Asia Pacific remains the region with the highest overall demand, there has been a significant increase in the expected number of skilled resources required in other parts of the world. New market opportunities, such as the opening of Cuba for the North American market and increased intra-Europe travel for the European market, have strengthened demand.

Demand for locally sourced and qualified pilots

Regional markets that have relied heavily on recruiting pilots from outside their home locations are increasingly seeking to recruit, train, and develop locally sourced pilots. New market opportunities are creating an increased demand for qualified, skilled, and experienced pilots.

Over the next 20 years, the Asia Pacific region will lead the worldwide growth in demand for pilots, with a requirement for 248,000 new pilots. North America will require 112,000, Europe 104,000, the Middle East 58,000, Latin America 51,000, the Commonwealth of Independent States (CIS) / Russia 22,000, and Africa 22,000.

New Pilots by Region (2016-2035)



● Asia Pacific	248,000
● North America	112,000
● Europe	104,000
● Middle East	58,000
● Latin America	51,000
● CIS	22,000
● Africa	22,000
World Total	617,000

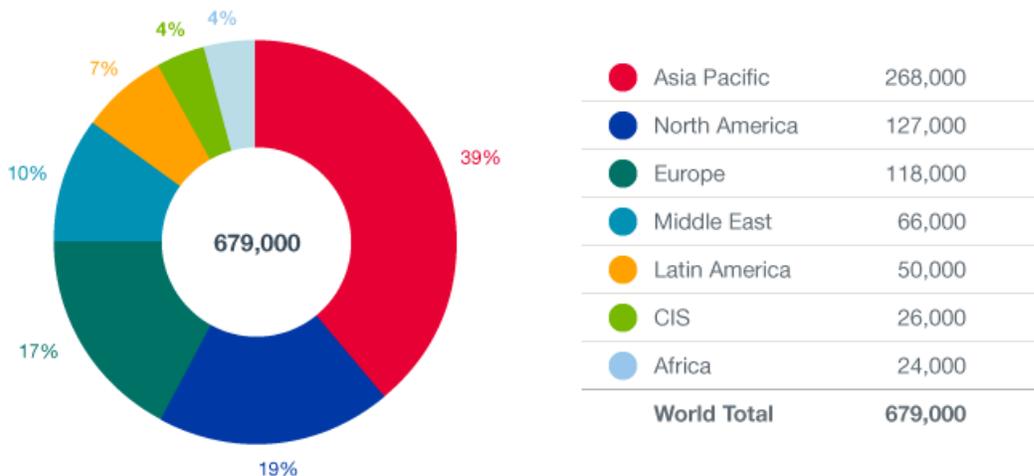
Airplane reliability affecting maintenance

As newer generation airplanes become more prevalent in worldwide fleets over the next 20 years, airplane reliability will improve, and maintenance check intervals will lengthen. Although this trend will moderate demand for maintenance personnel somewhat, the global need for technicians will remain strong.

Global fleet growth, along with the increasing trend for operators to outsource maintenance, repair, and overhaul activities to third-party providers, will drive an increased need for qualified technicians.

The need for maintenance personnel is largest in the Asia Pacific region, which will require 268,000 new technical personnel. Airlines in North America will require 127,000, Europe 118,000, the Middle East 66,000, Latin America 50,000, CIS / Russia 26,000, and Africa 24,000.

New Technicians by Region (2016-2035)

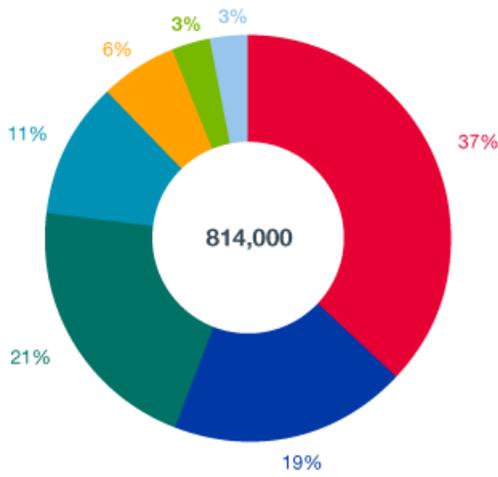


Operational improvements expand cabin crew demand

As airlines continue to expand flight routes, grow their fleet, and transition to airplanes with higher seat capacity, an increasing number of cabin crew personnel will be needed to ensure the safety and comfort of passengers. With a focus on operational improvements, many regional markets have also updated regulations to require a greater number of cabin crew per aircraft.

Over the next 20 years, the largest projected growth in cabin crew demand is in the Asia Pacific region, with a requirement for 298,000 new cabin crew. Europe will require 169,000, North America 151,000, Middle East 92,000, Latin America 51,000, Africa 27,000, and CIS / Russia 26,000.

New Cabin Crew by Region (2016-2035)



Asia Pacific	298,000
Europe	151,000
North America	169,000
Middle East	92,000
Latin America	51,000
CIS	26,000
Africa	27,000
World Total	814,000

Long-Term Market Current Market Outlook 2016-2035



Long-Term Market



Building Tomorrow's Planes
Today



Business and Market
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Traffic and Market Outlook



World Regions



Pilot & Technician Outlook



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RICK SCOTT
GOVERNOR

CAREER AND TECHNICAL EDUCATION MONTH

WHEREAS, profound economic and technological changes in our society are rapidly reflected in the structure and nature of work, placing new and additional responsibilities on our educational system; and

WHEREAS, the efforts of career and technical educators, business and industry stimulate the growth and vitality of our local economy and that of the entire nation, by preparing graduates for careers that are forecast to experience the largest and fastest growth in the next decade; and

WHEREAS, career and technical education serves as the backbone of a strong, well-educated workforce and contributes to America's leadership in the international marketplace; and

WHEREAS, the workers of tomorrow are in our classrooms today, career and technical education provides Floridians with a school-to-careers connection, helping students experience practical and meaningful applications of any number of skills; and

WHEREAS, more than 415,000 secondary job preparation students and 185,000 postsecondary career and technical education students in Florida engage in this type of meaningful education; and

WHEREAS, secondary schools in all 67 school districts, all 28 Florida Colleges and all 48 technical centers offer career and technical education courses; and

WHEREAS, more than 430,000 secondary students are enrolled in one of over 2,060 registered Career and Professional Education Academies and more than 15,300 registered Career-Themed Courses; and

WHEREAS, Florida students have earned over 82,000 industry certifications and over 23,000 digital tools certificates; and

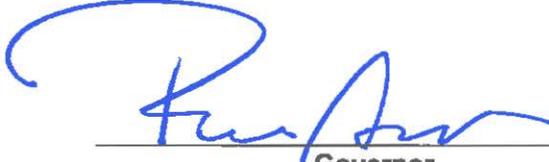
WHEREAS, nearly all of Florida's public technical centers accepted the "Ready, Set, Work" Guarantee Challenge to guarantee businesses that their workers will be ready to work on the very first day in the job, or will be retrained at no cost to the business or the student; and

WHEREAS, career and technical education offers individuals lifelong opportunities to learn new skills, providing career choices and potential satisfaction;

NOW THEREFORE, I, Rick Scott, Governor of Florida do hereby extend greetings and best wishes to all observing February 2017 as *Career and Technical Education Month*.



IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Florida to be affixed at Tallahassee, the Capital, this first day of February, in the year two thousand seventeen.



Governor

FLORIDA SOUTH WESTERN STATE COLLEGE

AIRFRAME MECHANICS & AIRCRAFT POWERPLANT TECHNOLOGY PROGRAM:

*Regional Program Overview
and Program Gap Analysis*

emsi

PREPARED BY EMSI
SEPTEMBER 2015

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EXECUTIVE SUMMARY

Florida South Western State College (FSW) is located in Fort Myers, FL and serves five counties (Charlotte, Collier, Glades, Hendry, and Lee Counties) in southwestern Florida. FSW believes that this program could also address need in six other counties (DeSoto, Hardee, Highlands, Manatee, Palm Beach, and Sarasota) in southern Florida. This report outlines the analysis of the proposed Airframe Mechanics & Aircraft Powerplant Technology program in the combined region, herein referred to as the “FSW A&P Region.” This report also provides a “gap” analysis and a program specific economic impact study to determine the demand for airframe mechanics and related A&P occupations and the economic impacts of starting an “A&P” program in the region. Here are some key findings of the analysis:

REVIEW OF POTENTIAL A&P PROGRAM

- The proposed A&P program is envisioned to be a program offering courses in both Airframe Mechanics & Aircraft Maintenance Technology/Technician and Aircraft Powerplant Technology/Technician. The program will be aimed to equip graduates with the necessary knowledge and skills to pass the FAA certifications for A&P workers.
- The job market for A&P occupations in the FSW A&P Region is fairly stable, averaging 20 monthly postings and 47 monthly hires over the past two years (Apr. 2013 to Apr. 2015).
- From the analysis of CareerBuilder resume data, we see that the majority of completers of A&P programs at Florida colleges stay in the state of Florida or the southeastern US.
- A&P occupations are extremely male dominated in both the FSW A&P Region and nationwide.

PROGRAM GAP ANALYSIS

- At the certificate level, the Airframe Mechanics & Aircraft Maintenance Technology/Technician and Aircraft Powerplant Technology/Technician programs had significant workforce gaps of 18 and 12, respectively.
- At the associate’s degree level, the A&P related programs also had significant workforce gaps of 24 and 15, respectively.
- The A&P occupations identified have high median hourly earnings (greater than \$24 an hour), which bodes well for students seeking A&P degrees in the future.

PROGRAM SPECIFIC ECONOMIC IMPACT STUDY

- The total economic impacts of this potential A&P program to the regional economy in 2014 would have been over \$118.2 million, assuming the program was implemented in 2004.
- Assuming that these completions follow the trend identified by FSW, there would have been 188 completers of this A&P program entering into the workforce in 2014, meaning that the economic impact per completer would have been over \$629,400; again assuming the program was implemented ten years previous.
- Looking at the lifetime earnings of these completers, a graduate of the potential new A&P program is expected to earn approximately \$373,000 more in his or her working life in discounted present value dollars than if he or she had never received credentials in this program.

INTRODUCTION

Colleges face many challenges in their efforts to identify the training needs of their service regions. They must account for regional economic trends and the changing quality of the workforce. Furthermore, as technology progresses, colleges need to address the increasingly complex and specialized skills required by employers. In light of these dynamics, an understanding of the regional economy and the demand for skilled labor is vital to the planning efforts of colleges seeking to adapt their program offerings to the requirements of an ever-changing workforce.

To gain better insight into economic conditions and workforce trends, Florida South Western State College (FSW) partnered with Economic Modeling Specialists Intl. (EMSI) to conduct a program review of the FSW A&P Region, a workforce “gap” analysis, and a program specific economic impact study of the potential A&P program. Gap analysis is a technique used to assess the supply and demand of skilled workers and identify the program potential where gaps exist. The analysis weighs the educational output of FSW and other regional institutions against the number of job openings related to the institutions’ program offerings in an effort to determine whether an oversupply or an undersupply of skilled workers exists. The goal of the analysis is to provide FSW with relevant data and information that it can use when solving problems and making

decisions about current and future program development. The economic impact study, on the other hand, provides information on how much the potential program would contribute to the regional economy.

The first regional backdrop used in this report is defined by 11 counties in southern Florida, comprised of FSW’s service region, Charlotte, Collier, Glades, Hendry, and Lee Counties combined with six others (DeSoto, Hardee, Highlands, Manatee, Palm Beach, and Sarasota Counties). This regional backdrop will be referred to as the “FSW A&P Region.” See Figure 1 for a map of the region.¹ This region includes the Cape Coral, Palm Beach, and Sarasota metropolitan statistical areas and the majority of the area between them.

The report is broken into three sections. The first section analyzes the current educational output of A&P programs in Florida and the potential A&P program in the FSW A&P Region, as well as skills, job postings, and demographic overviews. The second section summarizes the results of the A&P program gap analysis. The third section includes the results of the program specific economic impact study (PSEIS) i.e. how the potential A&P program will benefit the regional economy. After a brief conclusion, detailed information, data, and methodologies are provided in the appendices.

1 The industry and occupation data presented in this report reflect the number of jobs by place of work, not by place of residence. However, the report does assess the commuting patterns of residents to determine where they live and work, both within and outside of the region.

I. REVIEW OF THE POTENTIAL A&P PROGRAM

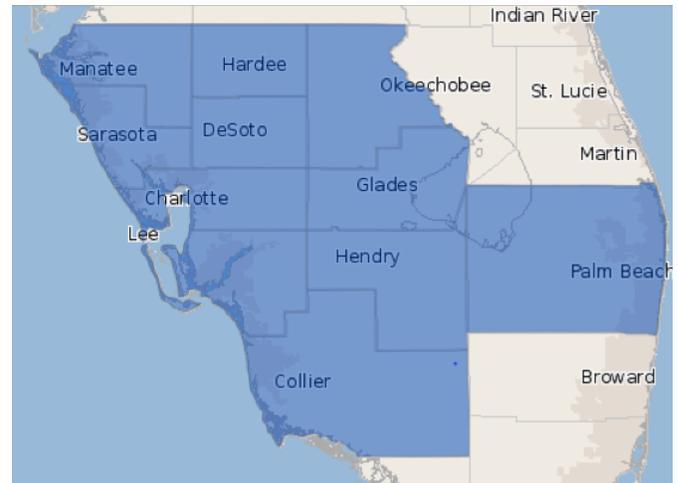
Florida Southwestern State College (FSW) has engaged EMSI in order to better understand the potential demand for airframe mechanics & aircraft powerplant (A&P) technicians within the FSW A&P Region.

PROGRAM RESEARCH FOR THE POTENTIAL A&P PROGRAM

The potential A&P program envisioned by FSW is a program offering courses in both Airframe Mechanics & Aircraft Maintenance Technology/Technician (Classification of Instructional Program–CIP Code 47.0607) and Aircraft Powerplant Technology/Technician (CIP Code 47.0608). This program is envisioned to cover both subjects equally with courses giving exposure in all areas necessary for the Federal Aviation Administration’s (FAA’s) aviation maintenance technician- general, airframe, and powerplant knowledge certification. While the details of this certification are too lengthy to include in this analysis, the general skills required for FAA certification are: aircraft maintenance, preventative maintenance, knowledge of airframe materials, and aircraft powerplant or engine maintenance, and various other safety and mechanical maintenance skills.

In order to gain an FAA certification, one must be 18-years old, have 18 to 30 months of practical experience with aircraft powerplants and/or airframes, and pass all three FAA certification tests (written, oral, and practical). To that end, one can either go through a FAA-Approved Aviation Maintenance Technician School or a related program at a college or university with FAA approval. It is not necessary to go through a specific program, as military or civilian aircraft maintenance experience will suffice, but it is recommended. General mechanic and maintenance knowledge is helpful, but due to the level of technicality of the FAA certification, aircraft experience is imperative.

FIGURE 1: MAP OF FSW A&P REGION



Education Output for A&P Occupations

Table 1 on the next page lists all A&P programs and their average annual completers in Florida. In all of the state of Florida, there are only 614 postsecondary certificate completers and 66 associate’s degrees across nine institutions. FSW’s potential A&P program would be one of only two programs available in the FSW A&P Region; the other being at the Lorenzo Walker Institute of Technology. The program at Lorenzo Walker only has an average 10 completers over the past three years. The largest program in the state is the program at the National Aviation Academy of Tampa Bay with 248 certificate completers. The only associate’s degree programs available are at Embry-Riddle Aeronautical University (an on-line/distance learning institution). Therefore, FSW would be the only institution offering both a postsecondary certificate and an associate’s degree option for the potential A&P program. Other programs in the state may be looking to further develop their programs, but as of the year 2013, no programs have completers for both certificates and associate’s degrees. (Note: Institutions with bachelor’s degree programs and above were not analyzed, due to the desired education levels to be offered

TABLE 1: SUMMARY OF COMPLETIONS FOR A&P PROGRAMS IN FLORIDA STATE

A&P PROGRAM INSTITUTIONS	CERTIFICATES	ASSOCIATE'S DEGREES	TOTAL COMPLETIONS	PERCENT OF TOTAL
Aviation Institute of Maintenance-Orlando	79	0	79	12%
Broward College	95	0	95	14%
Embry-Riddle Aeronautical University-Daytona Beach	0	27	27	4%
Embry-Riddle Aeronautical University-Worldwide	0	39	39	6%
Florida State College at Jacksonville	46	0	46	7%
George T Baker Aviation School	107	0	107	16%
Lively Technical Center	12	0	12	2%
Lorenzo Walker Institute of Technology	10	0	10	1%
National Aviation Academy of Tampa Bay	248	0	248	36%
Tom P Haney Technical Center	17	0	17	3%
Grand Total	614	66	680	100%
AVIATION/AIRWAY MANAGEMENT & OPERATIONS PROGRAM INSTITUTIONS	CERTIFICATES	ASSOCIATE'S DEGREES	TOTAL COMPLETIONS	PERCENT OF TOTAL
Broward College	7	104	110	37%
Embry-Riddle Aeronautical University-Worldwide	0	0	0	0%
Florida State College at Jacksonville	0	75	75	25%
Miami Dade College	31	75	106	35%
Palm Beach State College	0	1	1	0%
Santa Fe College	0	2	2	1%
St Petersburg College	0	5	5	2%
Grand Total	38	262	299	100%

All figures are a 3-year average

Source: National Center for Education Statistics – IPEDS

in the potential A&P program at FSW). Table 1 also shows the completions data for Aviation/Airway Management & Operations programs in Florida.²

With a few private and public airports in the region, such as the Southwest Florida International Airport and the Charlotte County Airport, and the advent of the Airglades Project in Hendry County, there may be a number of A&P related jobs opening up in the near future. The A&P jobs identified for the purposes of this analysis are: avionics technicians; airframe mechanics & service technicians; and aircraft structure, surfaces, rigging, & systems assemblers. These occupations were chosen according to the Bureau of Labor Statistics (BLS) federal CIP to SOC (Standard Occupational Classification) mapping of the two A&P related programs. These three occupations will be referred to as the A&P occupations for this analysis. The next part of this section analyzes the A&P occupations in the FSW A&P Region.

² This program is not included in this analysis as an A&P program, but it is related to A&P programs. Completions data for this program were included merely for comparison purposes.

JOB POSTINGS FOR A&P RELATED OCCUPATIONS

Real-time job postings have become a popular option for supplementing traditional labor market information. Real-time data has its inherent weaknesses, such as the potential for double counting job postings and biases toward certain types of industries and occupations. It also has its strengths, in that the data represents up-to-the-minute demand for workers without the typical three- to six-month lag inherent in traditional labor market data. Real-time data is best used when it is understood as a relative indicator for occupations in the highest demand and demand change over recent months. It should not be taken as an absolute indicator for the number of real-world job openings that exist in a given time in a given place.

The data in Tables 2 and 3 were taken from EMSI's Job Postings Analytics tool, which accesses data from a third-party aggregator that includes CareerBuilder's vast network of job seeker websites and a large number of other websites. The statistics shown in Table 2 include "Aver-

age Monthly Postings (Apr 2013- Apr 2015)” and “Average Monthly Hires (Apr 2013- Apr 2015)”.

Table 2 compares the average monthly postings versus the average monthly hires in the FSW A&P Region. As shown, in the FSW A&P Region, there were 20 average monthly postings are 46 average monthly hires for all A&P occupations. Aircraft mechanics & service technicians had both the highest average monthly postings and hires over the past two years.

Many real-time sources purport to “de-duplicate” job postings, so that the same posting is never tallied more than once. In reality, job postings are notoriously difficult to de-duplicate. EMSI accepts the inherent difficulty of deduplication which is why we display both raw (unduplicated) job postings along with our best effort to de-duplicate these postings. As the name suggests, “Unique Postings” represent EMSI’s estimated de-duplicated job postings. The most complex statistic in this section, “Posting Intensity” is the ratio of total job postings to unique job postings for the given month.

Though we cannot say with certainty that a higher number of total (unduplicated) job postings will generate more jobs, it does indicate that employers are investing

heavily in their search for job candidates in these categories. To use an example, if an employer has one vacancy for a machinist, but the human resource director is determined to fill that position quickly, he may generate 25 postings over the course of a month to address that one vacancy. In reality, only one new machinist is required, but the high number of postings evidences the HR director’s strong demand for that worker. Therefore, higher numbers in “Posting Intensity” indicate that companies are heavily investing in recruiting workers for this position, and lower numbers indicate that the position is a lower priority for businesses. The “Posting Intensity” is shown in Table 3 broken-out by city in the FSW A&P Region for April 2015.

As Table 3 shows, the city with the most total job postings and posting intensity is West Palm Beach (36 total job postings and a 9 to 1 job posting intensity). A job posting intensity of 9 to 1 is fairly high for an occupation, and indicates relative urgency to hire A&P workers in West Palm Beach. Fort Myers has the highest number of unique job postings with six unique jobs postings. A further analysis of the cities highlighted in this table is needed to show whether or not the cities with lower or higher posting intensities are hiring more A&P workers.

TABLE 2: REAL TIME JOB POSTINGS DATA FOR A&P RELATED OCCUPATIONS IN THE FSW A&P REGION

SOC	TITLE	AVERAGE MONTHLY POSTINGS (APR2013-APR2015)	AVERAGE MONTHLY HIRES (APR2013-APR2015)
49-3011	Aircraft Mechanics and Service Technicians	16	38
49-2091	Avionics Technicians	4	4
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	0	5

Source: EMSI’s Job Postings Analytics tool

TABLE 3: TOP 10 CITIES POSTING FOR A&P OCCUPATIONS- FSW A&P REGION

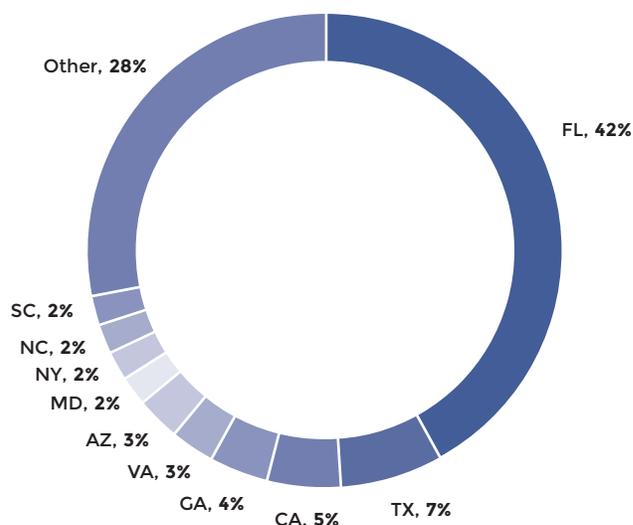
CITY	TOTAL POSTINGS (APR2015)	UNIQUE POSTINGS (APR2015)	POSTING INTENSITY (APR2015)
West Palm Beach, FL	36	4	9 to 1
Fort Myers, FL	18	6	3 to 1
Jupiter, FL	6	2	3 to 1
Sarasota, FL	6	2	3 to 1
Punta Gorda, FL	4	2	2 to 1
Boynton Beach, FL	2	1	2 to 1
Naples, FL	7	5	1 to 1
Venice, FL	1	1	1 to 1

Source: EMSI’s Job Postings Analytics tool

TABLE 4: TOP 10 STATES FOR A&P COMPLETERS IN A&P RELATED OCCUPATIONS

STATE	NUMBER OF OBSERVATIONS	PERCENTAGE OF TOTAL
Florida	611	41.5%
Texas	101	6.9%
California	67	4.5%
Georgia	63	4.3%
Virginia	48	3.3%
Arizona	45	3.1%
Maryland	36	2.4%
New York	32	2.2%
North Carolina	30	2.0%
South Carolina	30	2.0%
Other States	411	27.9%

FIGURE 2: TOP 10 STATES FOR A&P COMPLETERS



CAREERBUILDER RESUME DATA FOR A&P RELATED OCCUPATIONS

In addition to the job postings data from EMSI’s Job Posting Analytics tool, we took a more in depth look at the resume data available to EMSI through CareerBuilder. The resume data analyzed in this section is from aviation related programs in colleges in Florida. A total of over 5,000 observations were analyzed, 1,500 of which pertained to A&P related occupations. Of those nearly 1,500 observations, 41.5% of them remained in Florida after completing an aviation related program in Florida. Table 4 and Figure 2 displays the top 10 states that people relocated/settled after completing one of these programs. Table 5 shows how many observations there were per occupation that was directly related to mechanics and airframe mechanics. As the table shows, there were only 120 observations with these 19 specifically related A&P occupations.

TABLE 5: OBSERVATIONS IN A&P RELATED OCCUPATIONS

OCCUPATION	COUNT OF OBSERVATIONS
Aircraft Mechanics and Service Technicians	41
Avionics Technicians	20
Aerospace Engineers	13
Airline Pilots, Copilots, and Flight Engineers	9
Air Traffic Controllers	6
Industrial Machinery Mechanics	6
Aviation Inspectors	3
Machinists	3
Maintenance and Repair Workers, General	3
Transportation Security Officers	3
Aerospace Engineering and Operations Technicians	2
Air Crew Officers	2
Assemblers and Fabricators, All Other	2
Transportation Managers	2
Aircraft Launch and Recovery Specialists	1
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	1
Artillery and Missile Officers	1
Mechanical Engineering Technicians	1
Wind Energy Project Managers	1
Total	120

DEMOGRAPHICS OF A&P OCCUPATIONS IN THE FSW SERVICE REGION

The demographics of A&P workers in the FSW A&P Region were included for the purpose of examining the potential student population in the region. Tables 6, 7, and 8 on the next page show the demographics of A&P occupations in the FSW A&P Region by age cohort, race, and gender,

respectively. Please note that these figures are estimates based on national age distribution data, which is applied to the regional employment totals. Therefore, these data may or may not reflect the actual age distribution of these workers in the region.

Table 6 shows that of the 1,149 A&P workers in the region, the largest portion of them are between the ages of 45 and 54 years old. There are 207 A&P workers who are in the 25 to 34 year category; the most likely age group for college graduates. There are 50 A&P workers who would be considered above retirement age.

Table 7 shows the breakdown of A&P workers in the FSW Service Region population by race. The region is primarily “White, Non-Hispanic or Latino,” and the number of A&P workers who are “White, Non-Hispanic or Latino” reflects that.

Table 8 shows the region’s A&P workers by gender. The A&P occupations are dominantly male in both the FSW A&P Region and the nation, but more so in the region.

TABLE 8: DEMOGRAPHICS OF A&P OCCUPATIONS IN THE FSW A&P REGION BY GENDER

GENDER	2014 JOBS	PROPORTION	NATIONAL PROPORTION
Males	1,074	93.5%	90.0%
Females	75	6.5%	10.0%
Total	1,149	100.0%	100.0%

TABLE 6: DEMOGRAPHICS OF A&P OCCUPATIONS IN THE FSW A&P REGION BY AGE COHORT

AGE	2014 JOBS	PROPORTION
14 to 18 years	1	0.1%
19 to 24 years	55	4.8%
25 to 34 years	207	18.0%
35 to 44 years	248	21.6%
45 to 54 years	346	30.1%
55 to 64 years	242	21.1%
65 years and over	50	4.4%
Total	1,149	100.0%

TABLE 7: DEMOGRAPHICS OF A&P OCCUPATIONS IN THE FSW A&P REGION BY RACE

RACE	2014 JOBS	PROPORTION
White, Non-Hispanic or Latino	787	68.4%
Hispanic or Latino, All Types	253	22.0%
Black or African American, Non-Hispanic or Latino	81	7.0%
Asian, Non-Hispanic or Latino	15	1.3%
Two or More Races, Non-Hispanic or Latino	9	0.8%
American Indian or Alaska Native, Non-Hispanic or Latino	2	0.2%
Native Hawaiian or Other Pacific Islander, Non-Hispanic or Latino	2	0.1%
Total	1,149	100.0%

II. PROGRAM GAP ANALYSIS

The results that appear in this section present a focused view of A&P programs in the FSW A&P Region, and whether these programs have a regional gap or surplus. The potential A&P program was analyzed at the postsecondary certificate and associate's degree level, according to the program training levels FSW envisions for the potential program.

Each table includes the CIP code and title, the average annual openings associated with the program (which have been de-duplicated using the process outlined in Appendix 4), the average annual completers between 2011 and 2013, and finally the gap or surplus figure. If the numbers are positive, there is a shortage or “gap” of completers—i.e., there are more job openings in those occupations than there are graduates or completers. If the numbers are negative, then there are fewer annual job openings compared to the “surplus” of completers for those program groups. The median hourly wage rate for related occupations is included. Due to data limitations, the wages are aggregated for all education levels.

INTERPRETING GAP/SURPLUS ANALYSIS RESULTS

The gap analysis is intended to serve as a starting point for FSW as the College discusses regional workforce needs. A surplus or deficit of workers in a particular category does not necessarily indicate a problem for the region, and it is important that each occupation group be evaluated on a case-by-case basis. Evaluation of the program supply (surplus and gaps) will provide an understanding of the role skilled occupations play in economic sustainability and growth.

Other information should also be considered when evaluating these surpluses and gaps. For example, only the education supply pipeline is considered in this analysis because these numbers can be tracked at the county and school level. However, other sources of supply exist as well—unemployed workers, industry trained pipelines, in-migrators, and job changers from other occupational categories can also be a source of skilled occupations.

These types of considerations are useful when evaluating specific types of occupations. Unfortunately, secondary data sources (e.g., regional, state, and federal data) do not account for this, and primary data collection methods (i.e., interviews and surveys) are among the only ways to obtain information on this type of supply pipeline.

Lastly, it is important to keep in mind that the labor market is not so simple or efficient that one could expect supply and demand to be at perfect equilibrium for any extended period of time. As such, as a general rule of thumb, only programs with considerable gaps or surpluses should be considered long-term strategic issues worthy of closer examination. Given the size and characteristics of the FSWA&P Region, any gap or surplus within 10 jobs either above or below zero should be considered within the normal range of labor market fluctuations.

Once evaluated internally within the College, specific implications should be considered for programs with substantial surpluses or gaps. These implications include:

- **Surplus:** Oversupply of specific education completers may lead to higher attrition rates (i.e., brain drain). In other words, the region is educating a workforce that is leaving after program completion because of a lack of jobs. Note: In the analysis of the FSWA&P Region where the neighboring population density is high in neighboring areas, a surplus of completers may indicate the need for service region residents to commute outside of the service region to find job opportunities.
- **Gap:** Undersupply of specific program completers may lead to missed opportunities for economic growth and put stress on local businesses to find necessary human capital elsewhere. In other words, the region's education institutions are not providing the necessary workforce for the region and thereby shifting the burden on the industries to find workers in other economies to fill the needed occupations. This translates into higher human resources costs and decreased efficiencies in the economic system. This also provides an opportunity for institutions to develop new programs. Note: Given population density in the areas bordering the

service region, a completion gap may be filled by other institutions near the service region. This potential scenario will need to be taken into consideration from the leadership.

FSW A&P REGION GAP ANALYSIS FOR THE POTENTIAL A&P PROGRAM

Figures 3 and 4 provide an illustration that summarizes the gap for the certificate and associate’s degree level for the potential A&P program. Demand for A&P occupations in the FSW A&P Region were split into the two A&P related occupations: Airframe Mechanics & Aircraft Maintenance Technology/Technician (certificate level gap of 18) and Aircraft Powerplant Technology/Technician (certificate level gap of 12). These gaps are considered to be significant in the FSW A&P Region. The A&P programs at Lorenzo Walker Institute of Technology are the only programs in the A&P region and had a three-year average of 10 completers in the certificate level A&P programs.

At the associate’s degree level, the two A&P related occupations had a gap of 24 for Airframe Mechanics &

Aircraft Maintenance Technology/Technician and a gap of 15 for Aircraft Powerplant Technology/Technician. There were no regional completers for these programs at the associate’s degree level. Both of these programs have significant workforce gaps at the associate’s degree level.

Table 9 lists the same information that Figures 3 and 4 represent graphically. The table shows both the postsecondary certificate and associate’s degree level gaps for the FSW A&P Region.

Table 9 shows the de-duplicated average annual openings, a process that is explained in detail in Appendix 4 under “De-Duplication of Annual Openings.” This procedure is designed to reflect the unique supply and demand dynamics of the FSW A&P Region.

However, EMSI recognizes that in some cases a student from a less predominant educational program is a more likely candidate to be offered a local job. These alternative supply and demand calculations give equal weight to every job opportunity within students’ field of study, regardless of whether that program is a big or small player in talent development for the region. The exact demand depends on whether regional employers demonstrate a preference for existing educational providers or not.

FIGURE 3: POSTSECONDARY CERTIFICATE SUPPLY AND DEMAND FOR THE A&P PROGRAMS IN THE FSW A&P REGION

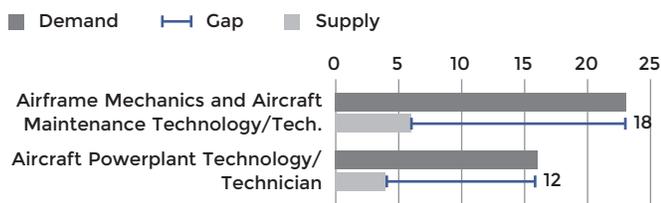


FIGURE 4: ASSOCIATE’S DEGREE SUPPLY AND DEMAND FOR THE A&P PROGRAMS IN THE FSW A&P REGION

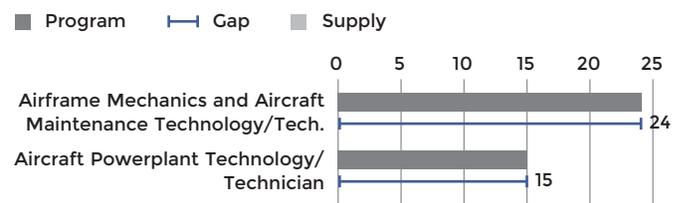


TABLE 9: SUPPLY AND DEMAND FOR THE A&P PROGRAM IN THE FSW A&P REGION

CIP CODE	CIP TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	AVERAGE ANNUAL FSW COMPLETERS	TOTAL GAP OR SURPLUS	MEDIAN HOURLY WAGE
POSTSECONDARY CERTIFICATE LEVEL						
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	23	6	0	18	\$24.99
47.0608	Aircraft Powerplant Technology/Technician	16	4	0	12	\$24.81
ASSOCIATE’S DEGREE LEVEL						
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	24	0	0	24	\$24.99
47.0608	Aircraft Powerplant Technology/Technician	15	0	0	15	\$24.81

Source: EMSI Gap Analysis Model
May not sum due to rounding

III. PROGRAM SPECIFIC ECONOMIC IMPACT STUDY

INTRODUCTION

This section describes the economic impact attributable to the potential A&P program to be offered by FSW. For this analysis, both A&P programs were analyzed, and then combined using proportions assumed by FSW to arrive at the figures for the potential new A&P program.³ “Economic impact” describes the full range of economic effects that can be directly attributed to each of the academic programs in terms of the increased wages rendered to program completers, the increased productivity for employers, and the increased earnings for other workers who either get jobs or are enabled to be more productive due to the contributions of FSW’s completers.

ECONOMIC IMPACT OF THE POTENTIAL A&P PROGRAM

Table 10 displays summary statistics on the two A&P related programs including the total regional economic impact attributable to program completers as of 2014, the number of completers active in the regional workforce as of 2014, and the 2014 economic impact per completer. The magnitude of the total economic impact is directly related to how long the program has been in existence

3 The potential A&P program is assumed to be 50% Airframe Mechanics & Aircraft Maintenance Technology/Technician and 50% Aircraft Powerplant Technology/Technician.

and how many completers have matriculated through the program. EMSI used assumed completer data from FSW across a ten-year period (AY 2003/2004 to AY 2013/2014); though the analyzed program has not been active for this period of time.⁴ A programs’ economic impact will generally increase with time. There are two key reasons for this: first, as more students enter the labor force, the program’s total economic impact will increase. Secondly, even if no additional completers enter the workforce, the economic impact will increase with time as the alumni gain greater work experience and earn higher wages.

Furthermore, it is important to note that although the total economic impact is a good indicator of the economic benefits provided to the FSWA&P Region, the per completer impact figures are a better indicator of each program’s potency in generating new economic activity. Though none of the A&P programs are a poor investment for taxpayers, those with lower per completer impact (those generating less than \$100k of impact) are inducing a relatively smaller amount of economic activity.

The total 2014 impact demonstrated in Table 10 includes the initial impact (alumni’s increased earnings due to their education at FSW) and various other multiplier effects. Multiplier effects refer to the additional income created in the economy as FSW alumni and their employers spend money within the region. The impacts are categorized according to the following four effects: the

4 Assumptions for these data were made by FSW.

TABLE 10: SUMMARY OF 2014 ECONOMIC IMPACT OF FSW’S POTENTIAL A&P PROGRAM

CIP	DESCRIPTION	TOTAL ECONOMIC IMPACT IN 2014	NUMBER OF COMPLETERS IN WORKFORCE IN 2014	2014 ECONOMIC IMPACT PER COMPLETER
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	\$118,410	188	\$628,900
47.0608	Aircraft Powerplant Technology/Technician	\$118,085	187	\$629,900
47.0607*	Potential New A&P Program	\$118,247	188	\$629,400

initial effect, the direct effect, the indirect effect, and the induced effect. Initial effects refer to wages paid to FSW alumni by employers. Direct effects occur as employers purchase goods and services from other local companies. Indirect effects occur as this secondary round of businesses purchase more goods and services from local companies. Finally, induced effects occur as these purchases create additional income for employees of all local businesses. Appendix 6 provides further information about EMSI's methodology, and within that appendix Table A6.1 breaks out each program's economic impact by category and shows the combined program impact for the potential A&P Program.

Graduates of FSW's combined potential program in A&P are expected to generate an estimated \$118.2 million in added income to the regional economy in 2014. This value represents 17.31% of FSW A&P Region's total economic output (or Gross Regional Product) for 2014. In terms of total economic impact in 2014, Airframe Mechanics & Aircraft Maintenance Technology/Technician ranked highest at \$118.4 million, and Aircraft Powerplant Technology/Technician had a slightly lower total economic impact at \$118.1 million. Therefore, combined with the correct percentages, the potential A&P program's total economic impact was \$118.2 million.

In terms of per completer economic impact, the Aircraft Powerplant Technology/Technician program had a higher per completer economic impact than Airframe Mechanics & Aircraft Maintenance Technology/Technician, which led to the combined A&P per completer economic impact to be \$629,400.

The per completer economic impact is highly correlated with the wage level of completers, so when alumni's earnings are high, the per completer economic impact tends to be high as well. Earnings are not the only factor driving economic impact. Some programs may prepare individuals for careers with low to moderate earnings, but income is generated for others within the region, particularly other

related to the industries employing these individuals. The two explanations for this situation are a strong regional supply chain for a given industry and capital-intensive methods within a given industry. Where strong regional supply chains exist, more spending by the business employing FSW alumni translates into greater in-region spending on inputs and supplies. In capital intensive industries, the amount spent by businesses employing FSW alumni may not be particularly high, but these businesses are simultaneously purchasing expensive equipment required to support those workers, thereby generating income and tax revenue within the region.

LIFETIME EARNINGS OF A&P PROGRAM COMPLETERS

Table 11 displays the expected earnings for FSW graduates over the course of their working careers, put in present value terms.⁵ Present value indicates that future values have been discounted based on the riskiness of students' investment in education and the time value of money.⁶ These earnings figures have been simulated using EMSI's program specific earnings forecast model, which accounts for educational level, years of experience, race/ethnicity, gender, occupation, and average regional earnings by occupation. Also displayed in Table 11 is a column indicating increased lifetime earnings of FSW completers as a result of their education. EMSI's economic impact model does not just quantify the gross earnings of completers over time, it also deducts the earnings that individuals would have collected had they never graduated from FSW at all, but pursued an alternative career. As such, this column represents a truer measurement of former students' increased

5 An average student is a composite of an average age, and average racial composition among all program completers.

6 Further explanation of the Present Value is explained in Appendix 6 under the section labelled Discount Rate.

TABLE 11: NET PRESENT VALUE (NPV) OF LIFETIME EARNINGS

CIP	TITLE	NPV OF LIFETIME EARNINGS WITH FSW DEGREE	NPV OF INCREASED LIFETIME EARNINGS DUE TO FSW DEGREE
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	\$897,488	\$524,292
47.0608	Aircraft Powerplant Technology/Technician	\$897,488	\$525,038
47.0607*	Potential New A&P Program	\$897,488	\$524,665

earnings. The values shown in the “increased earnings column” are simply around \$373,000 less than those in the total lifetime earnings column because alternative earnings are the same in each case.

Lifetime earnings are the same for the two A&P programs. However, Aircraft Powerplant Technology/Technician has slightly higher increased lifetime earnings than Airframe Mechanics & Aircraft Maintenance Technology/Technician. Compared to the earnings that students likely would have received had they just obtained a high school diploma and then gone directly into the workforce, all programs have positive returns. For example, a graduate

of the potential new A&P program is expected to earn \$372,823 more in discounted present value dollars, than if he or she had never received credentials in this program.

The estimated lifetime earnings of graduates in each program at every age between 18 and 67 are displayed in the Mincer curve figures in Appendix 6. For comparison purposes, each of these graphs also contains the estimated lifetime earnings those individuals had they only received a high school diploma and then entered the workforce. Further information on the earnings estimate model can also be found in Appendix 6.

CONCLUSION

The potential A&P program envisioned by FSW is a program offering courses in both Airframe Mechanics & Aircraft Maintenance Technology/Technician and Aircraft Powerplant Technology/Technician and will cover all the basic information necessary for completers to move on to get FAA certified as an A&P worker. While a degree is not absolutely necessary to be eligible to take the FAA certification tests, it is highly recommended.

The job market for A&P workers in the FSW A&P Region is fairly strong for aircraft mechanics and service technicians, and the market is very good for A&P job seekers in West Palm Beach. The development of the regional airports as well as the advent of the Airglades project bode well for A&P jobs in the near future. From the CareerBuilder resume data, we can tell that over half of all completers from Florida colleges stay in the state of Florida or the southeastern US. Nearly all workers in A&P occupations are male, the largest portion of which are between the ages of 45 and 54 years old.

From the Program Gap Analysis, we see that both the Airframe Mechanics & Aircraft Maintenance Technology/Technician and Aircraft Powerplant Technology/Technician programs have significant gaps in the FSW A&P Region at

both the postsecondary certificate and associate's degree levels. The A&P occupations associated with these programs also have high median hourly earnings (greater than \$24 an hour), which is attractive for students interested in getting an A&P certificate or associate's degree.

From the Program Specific Economic Impact Study, we see that if we were to assume that this program has been established for the past ten years, the total economic impacts to the regional economy in 2014 would have been over \$118.2 million. Assuming that these completions follow the trend identified by FSW, there would have been 188 completers of this A&P program entering into the workforce in 2014, meaning that the economic impact per completer would have been over \$629,400. Looking at the lifetime earnings of these completers, a graduate of the potential new A&P program is expected to earn around \$373,000 more in discounted present value dollars, than if they had never received credentials in this program.

Based on the various pieces of this analysis, development of a program in A&P could fill workforce gaps at both the certificate and associate's degree levels and have relatively large economic benefits to the regional economy.

APPENDIX 1: ABOUT EMSI DATA

As previously stated, EMSI data were used to calculate the projected number of annual job openings from 2014 to 2024. These projections take into account openings due to job growth and openings due to replacement needs. In order to capture a complete picture of industry employment, EMSI gathers and integrates economic, labor market, demographic, and education data from over 90 government and private-sector sources, creating a comprehensive and current database that includes both published data and detailed estimates with full coverage of the United States.

More specifically, EMSI develops this data by combining covered employment data from Quarterly Census of Employment and Wages (QCEW-produced by the Department of Labor) with total employment data in Regional Economic Information System (REIS-published by the

Bureau of Economic Analysis or BEA). This is augmented with County Business Patterns (CBP) and Non-Employer Statistics (NES) published by the US Census Bureau. Projections are based on the latest-available EMSI industry data, past 15-year local trends in each industry, growth rates in statewide and (where available) sub-state area industry projections published by individual state agencies, and (in part) growth rates in national projections from the Bureau of Labor Statistics.

Through this combination of data sources, EMSI is able to fill gaps in individual sources (such as suppressions and missing proprietors). This yields a composite database that leverages the strengths of all its sources. Finally, EMSI's database is updated quarterly, providing the most up-to-date integrated information possible.

APPENDIX 2: PROGRAM-TO-OCCUPATION MAPPING

Table A2.1 displays the crosswalk between educational programs (CIP codes) and occupations (SOC codes) that EMSI used to complete the gap analysis.

TABLE A2.1: CIP TO SOC MAPPING FOR A&P PROGRAMS

CIP CODE	TITLE	SOC CODE	TITLE	PROGRAM BASED WEIGHT	PSV AWARD OR "SOME COLLEGE"	ASSOC. DEGREE
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	49-2091	Avionics Technicians	1.00	65	87
		49-3011	Aircraft Mechanics and Service Technicians	0.57	69	90
		51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	0.57	85	93
47.0608	Aircraft Powerplant Technology/Technician	49-3011	Aircraft Mechanics and Service Technicians	0.43	69	90
		51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	0.43	85	93

APPENDIX 3: PROGRAM GAP ANALYSIS METHODOLOGY

This appendix focuses on describing and understanding the methodology used in the program gap analysis. This requires data on both occupation demand (e.g., annual job openings) and education supply (e.g., number of certificate and associate's degree completions). These are then compared through an education "gap" analysis to determine whether an education program is potentially producing a surplus or shortage of workforce talent relative to the number of job openings. In this way, it is possible to see how the institution's current programs are satisfying regional workforce needs.

SUPPLY AND DEMAND MODEL

EMSI builds a model using demand-side data (average annual openings) and supply-side data (postsecondary certificate and associate's degree education output), to compare workforce demand with education supply. The purpose of this analysis is to find the difference or "gap" between the average annual openings for A&P related occupations and the number of people completing degrees for those occupations, whether at FSW or at another training provider within the region. This makes it possible to identify whether there may be talent shortages or surpluses within the service region.

The first step involves mapping the linkage between annual openings for a SOC code and the number of completions for an education program CIP code. The BLS provides information on the occupations that completers of specific CIP codes are more likely to enter. Specific connections have been refined through previous engagements with education institutions and state departments of labor. Some programs have direct occupational ties. For example, a physical therapist assistant is a specific occupation that requires specialized postsecondary training. In this case, one CIP code (physical therapy technician/assistant) maps

to only one SOC code (physical therapists assistants). This provides an easy comparison of annual openings for physical therapist assistants to the number of people completing the relevant program to see whether a talent shortage or surplus exists. Unfortunately, this is not always the case. More often than not an educational program maps to multiple occupations and an occupation maps to multiple educational programs. For this reason, EMSI has pioneered a method of de-duplicating completers, such that the potential sources of supply are not double-counted for any occupation. The details of this process are outlined in this chapter, under "De-duplication of Annual Openings."

OCCUPATION DEMAND

Educational Level Adjustments

To capture occupation demand, EMSI uses a proprietary employment dataset that reflects total employment (i.e., employment covered by unemployment insurance as well as proprietor employment). The employment data reflects jobs for the first quarter of 2015. Within this dataset, EMSI calculates the number of regional annual job openings for A&P related occupations that require a postsecondary certificate or an associate's degree level of education.⁷The BLS also provides educational attainment data of current workers for each SOC code, broken out by their highest level of education attained. The data is presented as the percentage of workers in the SOC code with educational attainment ranging from less than a high school degree to a bachelor's degree. Using these data, EMSI adjusted the annual opening estimates for each SOC code to only incorporate the percentage of workers for the educational level that corresponds with FSW's proposed program.

For example, as shown in Table A3.1, there are three

⁷ See Appendix 1 for a description of the sources and processes of EMSI data.

TABLE A4.1: EDUCATIONAL LEVEL ADJUSTMENTS

CIP CODE	CIP TITLE	SOC	TITLE	ASSOCIATE'S DEGREE OR LOWER	BACHELOR'S DEGREE OR LOWER
43.0102	Corrections	33-3012	Correctional Officers and Jailers	86%	98%
		33-1012	First-Line Supervisors of Police & Detectives	59%	89%
		33-1011	First-Line Supervisors of Correctional Officers	71%	92%
Weighted Average				72%	93%

occupations trained for by Corrections (CIP code 43.0102). Within that cluster are an assortment of career fields, including correctional officers and jailers, first-line supervisors of police and detectives, and first-line supervisors of correctional officers. Among correctional officers, the majority of job openings (72%) are available to somebody with an associate's degree or lower. Alternatively, for first-line supervisors of police & detectives, only 59% of job openings are accessible to a person with an associate's degree. However, with a bachelor's degree, the amount of job openings accessible jumps up to 89%. The weighted average of job openings is calculated for each program at each program/degree level where FSW has produced completers over the past three years. Not taking into account the educational attainment dynamics in this way would bias the result by over-counting potential job opportunities for completers.⁸

De-duplication of Annual Openings

Most educational programs are designed to train people for multiple occupational types, many of which are simultaneously linked with other educational programs, presenting a complexity when comparing supply and demand for any particular educational program. For instance, the Computer Systems Networking & Telecommunications program is mapped to three different occupations: computer support specialists, information security analysts, and computer systems analysts. If we focus on just one of the occupations for this list—computer support specialists—it is also mapped to 10 different educational programs, spanning program titles such as Computer Systems Analysis and Medical Office Computer Specialist.

To ensure that no double-counting occurs, it is necessary to either realign the program groupings to eliminate the mapping of occupations to multiple programs, or to determine what proportion of demand should be compared with supply numbers from each program. EMSI

⁸ Given the changing dynamics and need for more education in the existing workforce (i.e., skills-biased technology change in many occupations and industry sectors), this assumption is considered conservative.

takes the second approach in this analysis, which has the advantage of maintaining the program titles and descriptions in roughly the same format that completer data were originally delivered to EMSI. EMSI uses a formula that favors program types with the largest number of completers, attributing a greater proportion of demand to these than the programs which produce a smaller number of completers. This method utilizes the assumption that the higher output educational programs are likely feeding a higher degree of demand within the service region.⁹

One possible criticism of this methodology is that it assumes, all else being equal, students from higher-output programs are more likely to obtain a job than students from lower-output programs, whereas in reality students are judged more by their skills and merits than their educational program of study. The intention of the analysis is not to rate students' capability of competing for jobs, but rather to capture the unique dynamics of the local labor market. For example, in a region where a unique program such as Commercial and Advertising Art is more prevalent than Graphic Design, it can safely be assumed that the graduates of the Commercial and Advertising Art program will be offered a larger number of local openings than are students from the Graphic Design program. If such were not the case, it would be unlikely for the Commercial and Advertising Art program to remain the producer of local talent in the long-term, as the program would yield students to a program with a more successful job placement rate.

Recognizing that some smaller programs produce students who are more capable of obtaining local jobs than students from larger programs, EMSI also provides an alternative gap analysis, which does not reduce the number of annual openings based on the size of each educational program. The results of the alternative gap analysis are included in Appendix 4.

⁹ Note this adjustment is performed on a program-by-program basis without consideration of individual colleges or training providers. Therefore, a single program offered at one large institution has no advantage over a group of similar programs offered a number of smaller educational providers provided that the aggregate output of the smaller schools is near the output of the single larger school.

APPENDIX 4: ALTERNATIVE GAP ANALYSIS CALCULATIONS

EMSI de-duplicated the annual openings shown in Section Two to account for the magnitude of output from different educational programs in the region. The process is explained in detail in Appendix 3 under “De-duplication of Annual Openings.” This procedure is designed to reflect the unique supply and demand dynamics of each regional economy. However, EMSI also recognizes that in some cases a student from a less predominant educational program is a more likely candidate to be offered a local job. These alternative supply and demand calculations give equal weight to every job opportunity within students’ field of study, regardless of whether that program is a big or small player in talent development for the region. Therefore, these estimates should be considered as less conservative measures than those from Section Two.

HIGHLIGHTS OF ALTERNATIVE GAP ANALYSIS

The gaps for A&P programs in the FSW A&P Region increased significantly in the alternative analysis. Table A4.1 shows that at the postsecondary certificate level, the gaps increased for Airframe Mechanics & Aircraft Maintenance Technology/Technician and Aircraft Powerplant Technology/Technician to gaps of 34 and 32, respectively. The same is true for these programs at the associate’s degree level, increasing to gaps of 43 and 41, respectively.

ALTERNATIVE GAP ANALYSIS TABLE

TABLE A4.1: ALTERNATIVE SUPPLY AND DEMAND FOR POTENTIAL A&P PROGRAMS

CIP CODE	CIP TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	AVERAGE ANNUAL FSW COMPLETERS	TOTAL GAP OR SURPLUS
POSTSECONDARY CERTIFICATE LEVEL					
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	39	6	0	34
47.0608	Aircraft Powerplant Technology/Technician	37	4	0	32
ASSOCIATE’S DEGREE LEVEL					
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	43	0	0	43
47.0608	Aircraft Powerplant Technology/Technician	41	0	0	41

Source: EMSI Gap Analysis Model
May not sum due to rounding

APPENDIX 5: DETAILED EMPLOYMENT PROJECTIONS

Table A5.1 displays the occupations that align with the potential A&P program in each of the FSW A&P Regions. The program mapping can be found in Table A2.1.

TABLE A5.1: DETAILED EMPLOYMENT PROJECTIONS RELATED TO POTENTIAL A&P PROGRAM- FSW A&P REGION

SOC	OCCUPATION	2014 JOBS	2024 JOBS	CHANGE	PERCENT CHANGE	PROJECTED ANNUAL OPENINGS
49-2091	Avionics Technicians	93	111	18	19%	4
49-3011	Aircraft Mechanics and Service Technicians	854	980	126	15%	39
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	202	280	78	39%	12

APPENDIX 6: ECONOMIC IMPACT ANALYSIS MODEL AND DATA

METHODOLOGY

In this report, EMSI aims to assess the economic impact of a potential A&P program on the local economy. EMSI also has a college-wide economic impact study (EIS) that analyzes the broad impact of the college in terms of college operations, student spending, and student productivity. The strength of the EIS model is that it encompasses all forms of impact that a college may have on a community, but it lacks the ability to narrow in on specific impacts of particular programs. This study focuses on the economic impacts generated by students from five specific programs, with particular focus on their future productivity in the workforce.

The unique challenge of the program specific model is predicting the lifetime earnings curve of workers by occupation. Research on the relationship between earnings, education and experience extends back to economist Jacob Mincer, who first explored the issue in the 1930s. At the time, he developed a model to explain how education and experience affects earnings, later to be termed the Mincer Curve. Since that time, economists have continued to use and improve upon the tools developed by Mincer, but EMSI is the first to integrate occupational specific effects into its model. This is critically important for producing a program specific economic impact model because individuals in different occupations receive different returns on education and experience. For example, many professional occupations, such as lawyers and professors, will continue to see appreciation in annual earnings late into their working careers, whereas occupations that require intense physical labor such as electricians and automotive repair see peak wages much earlier in their careers. Likewise, some workers, such as those in management and education, experience a greater return for educational attainment than other types of workers.

Another methodological component that EMSI considers in this analysis is called counterfactuals, or opportunity costs. Essentially, counterfactuals are deductions from gross measurements to account for alternate possibilities in use of assets. These deductions account for positive effects that would have manifested even without the presence of the thing being measured. The challenge in this case is to determine what proportion of the total economic impact generated by FSW alumni should be attributed to the education these individuals received at FSW. In other words, what are these FSW alumni doing in the economy that other workers could not do? Cursory reflection is enough to reveal that in most cases employers have the option to substitute one type of worker for another. For example, if a hospital is unable to find a qualified registered nurse, methods of operation could be adjusted so that workers of other occupational categories (e.g.: nursing assistance, LPNs, etc.) could take on the work that would have been assigned to the registered nurse. The ease with which businesses can replace the knowledge, skills, and abilities of one worker for another is that occupational category's marginal rate of substitution. This rate of substitution varies depending on the occupation, with some nearly indispensable occupations receiving very little reduction of the gross effects and others more transferable occupations receiving large reductions.

If data existed that indicates the alternate staffing options of various industry groups, which did not also alter the all other potential variables (such as cost and availability of labor), EMSI could use these data to estimate the elasticity of labor between different types of workers. However, in the absence of such data, EMSI estimates the elasticity with available empirical data in the form of compatibility scores. To determine these substitution effects, EMSI used its own proprietary compatibility index, which measures the similarity in knowledge, skills, and

abilities between different types of workers. All 784 5-digit Standard Occupational Classification (SOC) codes were ranked on a “dispensability index” based on the number of other workers in the region that were compatible enough to effectively perform the same basic work functions.

DISCOUNT RATE

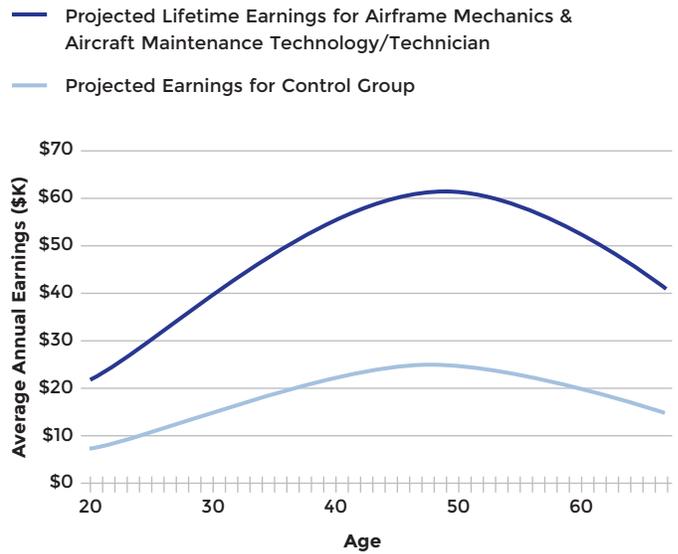
The estimated lifetime earnings values shown in this report are calculated based on the expected earnings of completers for each year of their careers. These values are not reported in gross terms but rather discounted to account for future value. This discount rate converts future monies to their present value. In investment analysis, the discount rate accounts for two fundamental principles: 1) the time value of money, and 2) the level of risk that an investor is willing to accept. Time value of money refers to the value of money after interest or inflation has accrued over a given length of time. An investor must be willing to forgo the use of his money in the present if he wishes to receive compensation for it in the future. Typically this minimum rate of return is determined by the known returns of less risky assets where the investors might alternatively consider placing their money. In this study, EMSI assumes a 4.5% discount rate for students.¹⁰ Therefore, the dollar amounts stated for lifetime earnings increase is expressed as the value of the lifetime earnings increase in today’s dollars.

ABOUT THE DATA

The program specific model utilizes five-year panel data from the American Community Survey Public Use Micro-

¹⁰ This value is based on the baseline forecasts for the 10-year zero coupon bond discount rate published by the Congressional Budget Office. See the Congressional Budget Office, Student Loan and Pell Grant Programs - March 2012 Baseline.

FIGURES A6.1: PROJECTED EARNINGS CURVE FOR AIRFRAME MECHANICS & AIRCRAFT MAINTENANCE TECHNOLOGY/TECHNICIAN



FIGURES A6.2: PROJECTED EARNINGS CURVE FOR AIRCRAFT POWERPLANT TECHNOLOGY/TECHNICIAN

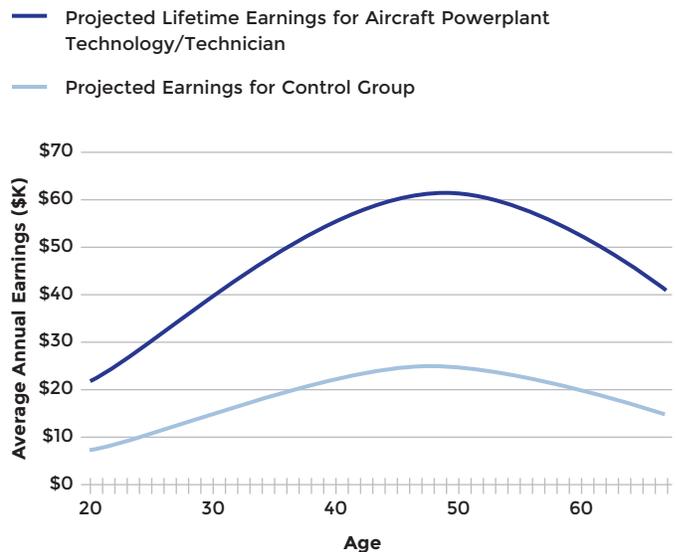


TABLE A6.1: 2014 DETAILED ECONOMIC IMPACT OF FSW’S A&P RELATED PROGRAMS

CIP	DESCRIPTION	INITIAL EFFECT	DIRECT EFFECT	INDIRECT EFFECT	INDUCED EFFECT	TOTAL EFFECT
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	\$79,797	\$9,649	\$2,126	\$26,838	\$118,410
47.0608	Aircraft Powerplant Technology/Technician	\$79,642	\$10,121	\$2,230	\$26,092	\$118,085
47.0607*	Potential New A&P Program	\$79,720	\$9,885	\$2,178	\$26,465	\$118,247

data (PUMS) 2008-2012. The PUMS data contain detailed records of employment status, occupational category, earnings, age, and numerous other fields for roughly 1.4 million workers per year. Using these data, EMSI ran a multivariate regression to estimate wages based on occupation, years of education, years of experience, and other control variables.

To determine economic impacts, we rely on a specialized Social Accounting Matrix (SAM) model to calculate the additional income created in the FSWA&P Region economy as a result of the added skills of MCC students. EMSI's Multi-Regional Social Accounting Matrix (MR-SAM) represents the flow of all economic transactions in a given region. It replaces EMSI's previous input-output (IO) model,

which operated with some 1,100 industries, four layers of government, a single household consumption sector, and an investment sector. The old IO model was used to simulate the ripple effects (i.e., multipliers) in the regional economy as a result of industries entering or exiting the region. The SAM model performs the same tasks as the old IO model, but it also does much more. Along with the same 1,100 industries, government, household and investment sectors embedded in the old IO tool, the SAM exhibits much more functionality, a greater amount of data, and a higher level of detail on the demographic and occupational components of jobs (16 demographic cohorts and about 750 occupations are characterized).

Florida Job Growth Grant Fund
Workforce Training Grant Proposal
Florida SouthWestern State College

A. Provide the title and a detailed description of the proposed workforce training.

Airframe/Powerplant Mechanic - Florida SouthWestern State College (FSW) will provide training leading to FAA approved Postsecondary Adult Vocational Certificates (PSAVs) in Aviation Airframe Mechanics and Aviation Powerplant Mechanics. Establishment of these programs leads to a potential Associate in Science (AS) degree program in Aviation Maintenance Management.

B. Describe how this proposal supports programs at state colleges or state technical centers.

A program gap analysis performed by EMSI in September 2015 details that a ten county A&P Region encompassing Manatee, Sarasota, Charlotte Lee, Collier, Hardee, DeSoto, Glades, Hendry, Palm Beach and a portion of Glades County indicates that of the current existing demand for A&P mechanics in the region, only 25% percent of the demand for workforce is currently being met in the region is being met by all educational institutions in the same region. Furthermore, none (0%) of the existing demand for Associate's degree workforce is met within the region. The FSW A&P program will be the first and only Associate's level program provided by a state college in the region and the second of two institutions providing related certificate programs. FSW will be the only institution in the region offering both a postsecondary certificate and a potential associate's degree option for the A&P program.

The level of workforce production within the State in the aggregate is insufficient to meet the demand of existing employers. The FSW A&P program will add additional capacity to meet existing needs and to further efforts to expand statewide efforts to attract additional employers, more specifically to catalyze aviation industry expansion within SW Florida.

FIGURE 1: MAP OF FSW A&P REGION



TABLE 1: SUMMARY OF COMPLETIONS FOR A&P PROGRAMS IN FLORIDA STATE

A&P PROGRAM INSTITUTIONS	CERTIFICATES	ASSOCIATE'S DEGREES	TOTAL COMPLETIONS	PERCENT OF TOTAL
Aviation Institute of Maintenance-Orlando	79	0	79	12%
Broward College	95	0	95	14%
Embry-Riddle Aeronautical University-Daytona Beach	0	27	27	4%
Embry-Riddle Aeronautical University-Worldwide	0	39	39	6%
Florida State College at Jacksonville	46	0	46	7%
George T Baker Aviation School	107	0	107	16%
Lively Technical Center	12	0	12	2%
Lorenzo Walker Institute of Technology	10	0	10	1%
National Aviation Academy of Tampa Bay	248	0	248	36%
Tom P Haney Technical Center	17	0	17	3%
Grand Total	614	66	680	100%
AVIATION/AIRWAY MANAGEMENT & OPERATIONS PROGRAM INSTITUTIONS	CERTIFICATES	ASSOCIATE'S DEGREES	TOTAL COMPLETIONS	PERCENT OF TOTAL
Broward College	7	104	110	37%
Embry-Riddle Aeronautical University-Worldwide	0	0	0	0%
Florida State College at Jacksonville	0	75	75	25%
Miami Dade College	31	75	106	35%
Palm Beach State College	0	1	1	0%
Santa Fe College	0	2	2	1%
St Petersburg College	0	5	5	2%
Grand Total	38	262	299	100%

All figures are a 3-year average

Source: National Center for Education Statistics – IPEDS

- C. Describe how this proposal provides participants transferable, sustainable workforce skills applicable to more than a single employer.

This introduction to Boeing’s Market Outlook Report for 2016-2035 perfectly captures the purpose of this grant request:

“As global economies expand and airlines take delivery of tens of thousands of new commercial jetliners over the next 20 years, there is extraordinary demand for people to fly and maintain these airplanes. To meet this tremendous growth, the 2016 Boeing Pilot and Technician Outlook forecasts that between now and 2035, the aviation industry will need to supply more than two million new aviation personnel - 617,000 commercial airline pilots, 679,000 maintenance technicians, and 814,000 cabin crew.

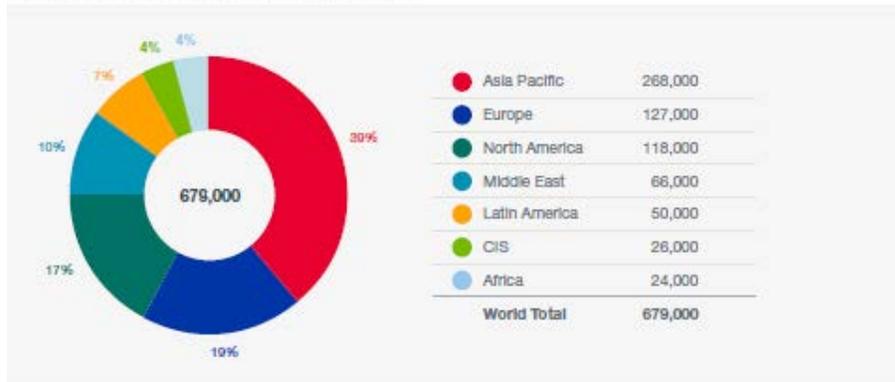
Meeting this demand will require innovative solutions - focused on educational outreach and career pipeline programs - to inspire the next generation of pilots, technicians, and cabin crew. New technologies, devices, and training methods will be needed to meet a wide range of learning styles. The growing diversity of aviation personnel will also require instructors to have cross-cultural and cross-generational skills to engage tomorrow's workforce.”

According to this leading report, worldwide demand for maintenance personnel is approximately 679,000 needed personnel from 2016-2035. In North America alone, the demand is projected at 127,000, the second highest demand, with only the Asia Pacific market with a higher need.

Beyond the aviation and aerospace industries, A&P trained and educated workers are highly sought after with skills that are transferable to several industries including: advanced manufacturing, life sciences in the development and production of medical devices, defense and Homeland Security, Logistics/Distribution, CleanTech and automotive industries.

The FSW A&P program is not intended to support a single employer, but more accurately, to provide support and workforce pipeline to all employers in these industries.

New Technicians by Region: 2016–2035



Source: Boeing Current Market Outlook Report, 2016

- D. Does this proposal support a program that is offered to the public? YES
- E. Describe how this proposal is based on criteria established by the state colleges and state technical centers.

This is best described by citing the missions and goals established by several statewide workforce and economic development related entities, including:

FSW mission:

The mission of Florida SouthWestern State College is to inspire learning; prepare a diverse population for creative and responsible participation in a global society; and serve as a leader for intellectual, economic, and cultural awareness in the community.

Florida College System Mission:

The mission of the Florida College System is to provide access to high-quality, affordable academic and career educational programs that maximize student learning and success, develop a globally competitive workforce and respond rapidly to diverse state and community needs.

CareerSource Florida Goals in support of WIOA:

Goal 1: Enhance alignment and market responsiveness of workforce, education and economic development systems through improved service integration that provide:

- Businesses with skilled, productive, and competitive talent; and

- Floridians with employment, education, training, and support services that reduce welfare dependence and increase opportunities for self-sufficiency, high-skill and high-wage careers and lifelong learning.

Goal 3. Improve career exploration, educational attainment and skills training for in-demand industries and occupations for Florida youth that lead to enhanced employment, career development, credentialing and post-secondary education.

Additionally, priorities established by Governor Scott in which include creating a world class education system and making Florida the number one state for job creation.

- F. Does this proposal support a program(s) that will not exclude unemployed or underemployed individuals? YES
- G. Describe how this proposal will promote economic opportunity by enhancing workforce training. Please include the number of jobs anticipated to be created from this proposed training. Further, please include the economic impact on the community, region, or state and the associated metrics used to measure the success of the training program.

Charlotte County in particular, and Southwest Florida in general has an older age demographic than many parts of the State and certainly the country. This results in lower workforce participation statistics, in Charlotte County workforce participation is 43%, Lee and Collier County participation rates are at 53% as compared to Duval and Hillsborough counties with participation rates over 63%. Increasing the educational opportunities available to K-12 graduates and adults seeking to retrain and advance their skills is critical in attracting new workforce age families and retaining K-12 graduates in the region. Industry specific certificate and degree programs are critical in creating a pipeline of workforce close to which companies in demand for that specific skill set, will locate.

The FSW A&P programs are slated to commence with 25 student seats at both the certificate and associate's degree level. The ability to expand this output is largely dependent upon funding for expansion as well as program participation. Based on the significant gap between graduates and industry demand, it is reasonable to conclude that expansion of the program outputs will be likely.

An economic impact of the A&P program was provided with the Program Gap Analysis conducted by EMSI (attached). This analysis concludes that the total economic impacts of the program to the regional economy over a ten year period will be over \$118.2 Million based on existing employers and demand in the region. This does not take into account impact in industries outside of Aviation nor the expansion of the industry cluster as a result of providing additional educational opportunities.

The FSW A&P program will be based at FSW's Charlotte campus and the Punta Gorda Airport (PGD). To illustrate potential economic impacts, this analysis looks at just the immediate

Charlotte County outlook, results can be extrapolated out for the entire region with some assumptions made for distance from the physical program location. This area has been designated as a targeted employment area and 4,000 acres zoned and permitted for industrial uses, such as manufacturing and distribution. Of the total, approximately 1,900 acres is part of the Punta Gorda Airport, the balance being in private ownership with varying degrees of site readiness. If the remaining acreage is built out with job creating users at a conservative rate of 3% per year the following impacts can be expected:

Development of 63 acres annually at a rate of 10,000 sf per year = 630,000 sf of new industrial space.

Capital Investment for physical plant assumes a conservative \$100/sf = \$63,000,000 of capital investment.

630,000 sf of new space/ 892 sf per employee = 706 new jobs

Average annual wage for manufacturing in FSW A&P region = \$24.81/hour (\$51,604 annually)

Total annual new salary = # jobs * wage = \$37,432,424

Charlotte County average annual wage for 2016 = \$37,011

FIGURE 3: POSTSECONDARY CERTIFICATE SUPPLY AND DEMAND FOR THE A&P PROGRAMS IN THE FSW A&P REGION

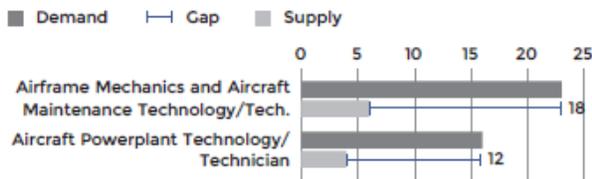


FIGURE 4: ASSOCIATE'S DEGREE SUPPLY AND DEMAND FOR THE A&P PROGRAMS IN THE FSW A&P REGION

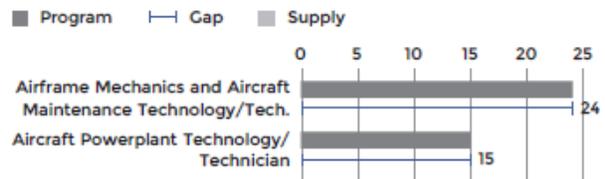


Figure 18
Manufacturing Industries
(Square Feet per Employee)

	Square Feet per Employee		
	1998	2002	2006
Food manufacturing	515	483	567
Beverage and tobacco product	990	874	1273
Textile mills and textile product mills	887	787	1552
Apparel manufacturing	534	230	704
Leather and allied product manufacturing	568	495	755
Wood product manufacturing	617	726	1091
Paper manufacturing	994	959	1132
Printing and related support activities	517	537	836
Petroleum and coal products manufacturing	714	633	570
Chemical manufacturing	1262	685	870
Plastics and rubber products manufacturing	899	807	1218
Nonmetallic mineral product manufacturing	785	904	973
Primary metal manufacturing	965	885	1306
Fabricated metal product manufacturing	757	729	964
Machinery manufacturing	708	566	860
Computer and electronic product manufacturing	360	365	429
Electrical equipment, appliance, and component manufacturing	2285	523	821
Transportation equipment manufacturing	544	540	999
Furniture and related product manufacturing	715	693	1558
Miscellaneous manufacturing	569	550	719
Manufacturing	744	617	892

Source: Energy Information Agency (EIA), Manufacturing Energy Consumption Survey (MECS),
Regional Plan Association (RPA) Calculations

SECTION 2: Additional Information

- I. Does the project have a local match amount? YES

If yes please describe the entity providing the match and the amount

Florida SouthWestern State College has invested resources in equipment, property (hangar at \$50,000 annually), and curriculum consultants (\$16,000), and if approved, estimated recurring expenses of \$233,708.96. FSW is also in discussions with aviation industry companies for potential in-kind contributions of aircraft estimated at \$1,209,000.

Section 3: Program Budget

C. Provide a detailed budget narrative, including timing and steps necessary to obtain the funding, how equipment purchases will be associated with the training program, if applicable, and any other pertinent budget-related information.

The majority of costs (\$2,010,849) consist of initial equipment, supplies, and materials essential to airframe and powerplant maintenance instruction (see attachment for examples). Remaining estimated costs of \$410,550 are for retrofitting the existing leased hangar for the instructional program. This includes:

Arch/Eng Design, permit drawings	\$25,000
Construction (including classroom)	\$360,000
Furniture	\$4,000.00 (Office)
Move in	\$2,000
Misc	\$19,550

If grant funding is approved, and upon distribution of funds, FSW will purchase supplies and equipment based a schedule of events determined by the FAA. Initial, year-one purchases will be used to create student teaching stations for the General and Airframe certification program. Concurrently, FSW will renovate our currently leased hangar to include a classroom, offices, and other teaching spaces. Subsequent purchases will be used to fund equipment and supplies for a year-two implementation of the Powerplant certification program.

Florida Department of Education
Curriculum Framework

Program Title: Aviation Powerplant Mechanics
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

PSAV – Career Preparatory	
Program Number	T640400
CIP Number	0647060801
Grade Level	30, 31
Standard Length	1,350 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.shtml
Basic Skills Level	Mathematics: 10 Language: 9 Reading: 10

Purpose

The purpose of this program is to prepare students for employment or advanced training in the commercial and general aviation industry. Instruction is designed to prepare students for Federal Aviation Administration (FAA) license examinations for Airframe ratings. Federal Aviation Regulation (FAR) Part 147 identifies minimum requirements for AMT schools. Any changes to the FAA-approved course content must be approved in advance. This program prepares students for employment as an Aviation Maintenance General Technician, and an Aviation Powerplant Maintenance Technician.

This program focuses on broad, transferable skills, stresses understanding of all aspects of the aviation maintenance industry, and demonstrates elements of the industry such as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of two occupational completion points. The Aviation Maintenance General Technician (AMT0705) course is the core course.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3) (b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the PSAV program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	AMT0705	Aviation Maintenance General Technician	AIR MECH @7 7G	450 hours	49-3011
B	AMT0775	Aviation Maintenance Powerplant Technician 1		450 hours	49-3011
	AMT0776	Aviation Maintenance Powerplant Technician 2		450 hours	

National Standards

Industry or National Standards corresponding to the standards and/or benchmarks for the Aircraft Airframe Mechanics program can be found using the following link:

<http://www.gpo.gov/fdsys/pkg/CFR-2012-title14-vol3/pdf/CFR-2012-title14-vol3-part147-appC.pdf>

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Perform basic aircraft drawing skills.
- 02.0 Demonstrate aircraft weight and balance skills.
- 03.0 Perform ground operations and servicing duties.
- 04.0 Demonstrate mathematical skills.
- 05.0 Maintain forms and records.
- 06.0 Apply principles of basic physics.
- 07.0 Demonstrate the use of maintenance publications.
- 08.0 Demonstrate appropriate communication skills.
- 09.0 Demonstrate employability skills as an Aviation Maintenance General Technician.
- 10.0 Maintain aircraft fluid lines and fittings.
- 11.0 Perform aircraft materials and processes skills.
- 12.0 Perform cleaning and corrosion-control operations.
- 13.0 Perform basic electricity skills.
- 14.0 Interpret mechanic privileges and limitations.
- 15.0 Perform basic reciprocating engine skills.
- 16.0 Perform basic turbine engine skills.
- 17.0 Perform engine inspection.
- 18.0 Maintain engine instrument systems.
- 19.0 Maintain engine fire-protection systems.
- 20.0 Maintain engine electrical systems.
- 21.0 Maintain lubrication systems.
- 22.0 Maintain ignition and starting systems.
- 23.0 Maintain fuel-metering systems.
- 24.0 Maintain engine fuel systems.
- 25.0 Maintain induction and engine airflow systems.
- 26.0 Maintain engine cooling systems.
- 27.0 Maintain engine exhaust and reverser systems.
- 28.0 Maintain aircraft propellers.
- 29.0 Maintain unducted fans.
- 30.0 Maintain auxiliary power units
- 31.0 Demonstrate knowledge of FAA Powerplant licensing requirements.
- 32.0 Demonstrate employability skills for an Aviation Maintenance Powerplant Technician (AMT) with an FAA Powerplant rating
- 33.0 Demonstrate an understanding of entrepreneurship opportunities in Aviation Powerplant Maintenance occupations.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Powerplant Mechanics
PSAV Number: T640400

Course Number: AMT0705
Occupational Completion Point: A
Aviation Maintenance General Technician – 450 Hours – SOC Code 49-3011

Course Description:

The Aviation Maintenance General Technician course prepares students for entry into the aviation industry. Students explore career opportunities and requirements of a professional aviation mechanic. Students study basic electricity, aircraft drawing, weight, balance, fluid lines, fittings, materials, processes, operations, services, cleaning, corrosion-control, math, forms, records, basic physics, maintenance publications, communication, and employability skills.

CTE Standards and Benchmarks	FAA FAR Part 147
01.0 Perform basic aircraft drawing skills--The student will be able to:	
01.01 Use aircraft drawings, symbols, and system schematics.	App. B, B, 7. Level 2
01.02 Draw sketches of repairs and alterations.	App. B, B, 8. Level 3
01.03 Use blueprint information.	App. B, B, 9. Level 3
01.04 Use graphs and charts.	App. B, B, 10. Level 3
02.0 Demonstrate aircraft weight and balance skills--The student will be able to:	
02.01 Weigh aircraft.	App. B, C, 11. Level 2
02.02 Perform complete weight-and-balance check and record data.	App. B, C, 12. Level 3
02.03 Properly configure aircraft for weighing and capable of setting up and using weighing equipment.	
03.0 Perform ground operations and servicing duties--The student will be able to:	
03.01 Start, ground operate, move, service, and secure aircraft and identify typical ground-operations hazards.	App. B, G, 20. Level 2
03.02 Identify and select fuels.	App. B, G, 21. Level 2
03.03 Comply with prescribed shop and personal safety procedures.	
04.0 Demonstrate mathematical skills--The student will be able to:	
04.01 Extract roots and raise numbers to a given power.	App. B, H, 24. Level 3

CTE Standards and Benchmarks	FAA FAR Part 147
04.02 Determine areas and volumes of various geometrical shapes by solving problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.	App. B, H, 25. Level 3
04.03 Solve ratio, proportion, and percentage problems.	App. B, H, 26. Level 3
04.04 Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	App. B, H, 27. Level 3
05.0 Maintain forms and records--The student will be able to:	
05.01 Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.	App. B, I, 28. Level 3
05.02 Complete required maintenance forms, records, and inspection reports.	App. B, I, 29. Level 3
06.0 Apply principles of basic physics--The student will be able to:	
06.01 Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight.	App. B, J, 30. Level 2
06.02 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.	
06.03 Draw conclusions or make inferences from data.	
06.04 Identify health-related problems that may result from exposure to work-related chemicals and hazardous materials and know the proper precautions required for handling such materials.	
06.05 Understand pressure measurement in terms of PSI, inches of mercury, and KPA.	
07.0 Demonstrate the use of maintenance publications--The student will be able to:	
07.01 Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.	App. B, K, 31. Level 3
07.02 Read technical data.	App. B, K, 32. Level 3
08.0 Demonstrate appropriate communication skills--The student will be able to:	
08.01 Write logical and understandable statements or phrases to accurately complete forms/invoices commonly used in business and industry.	
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.	
08.03 Read and follow written and oral instructions.	
08.04 Answer and ask questions coherently and concisely.	
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.	
08.06 Demonstrate appropriate telephone/communication skills.	
09.0 Demonstrate employability skills as an Aviation Maintenance General Technician--The student will be able to:	

CTE Standards and Benchmarks	FAA FAR Part 147
09.01 Conduct a job search.	
09.02 Secure information about a job.	
09.03 Identify documents that may be required when applying for a job position.	
09.04 Complete a job-application form correctly.	
09.05 Demonstrate job-interview skills.	
09.06 Identify appropriate responses to criticism from employer, supervisor, or other employees.	
09.07 Identify work habits for getting and keeping a job.	
09.08 Explain how to make job changes.	
09.09 Explain the purpose of the Federal Law as recorded in (29 CFR-1910.1200).	
10.0 Maintain aircraft fluid lines and fittings--The student will be able to:	
10.01 Fabricate and install rigid and flexible fluid lines and fittings.	App. B, D, 13. Level 3
10.02 Utilize proper personal safety procedures for fluid lines and fittings.	
11.0 Perform aircraft materials and processes skills--The student will be able to:	
11.01 Identify and select appropriate nondestructive testing methods.	App. B, E, 14. Level 1
11.02 Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections.	App. B, E, 15. Level 2
11.03 Perform basic heat-testing processes.	App. B, E, 16. Level 1
11.04 Identify and select aircraft hardware and materials.	App. B, E, 17. Level 3
11.05 Inspect and check welds.	App. B, E, 18. Level 3
11.06 Perform precision measurements.	App. B, E, 19. Level 3
11.07 Perform safety-wiring techniques.	
12.0 Perform cleaning and corrosion-control operations--The student will be able to:	
12.01 Identify and select cleaning materials.	App. B, G, 22. Level 3
12.02 Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning. Understand metal strength limitations when removing corrosion.	App. B, G, 23. Level 3
13.0 Perform basic electricity skills--The student will be able to:	
13.01 Calculate and measure capacitance and inductance.	App. B, A, 1. Level 2
13.02 Calculate and measure electrical power.	App. B, A, 2. Level 2
13.03 Measure voltage, current, resistance, and continuity.	App. B, A, 3. Level 3

CTE Standards and Benchmarks	FAA FAR Part 147
13.04 Determine the relationship of voltage, current, and resistance in electrical circuits.	App. B, A, 4. Level 3
13.05 Read and interpret aircraft electrical-circuit diagrams, including solid-state devices and logic functions.	App. B, A, 5. Level 3
13.06 Inspect and service batteries.	App. B, A, 6. Level 3
13.07 Utilize proper electrical safety procedures.	
14.0 Interpret mechanic privileges and limitations--The student will be able to:	
14.01 Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.	App. B, L, 33. Level 3
14.02 Identify the information in Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for Aviation Maintenance Technician (AMT) certification and ratings.	
14.03 Identify the FAA requirements that must be satisfied in order to display the FAA Airframe and Powerplant license.	

**Florida Department of Education
Student Performance Standards**

Course Number: AMT0775
Occupational Completion Point: B (1 of 2)
Aviation Maintenance Powerplant Technician 1 – 450 Hours – SOC Code 49-3011

Course Description:

The Aviation Maintenance Powerplant Technician 1 course is designed to build on the skills and knowledge students learned in the Aviation Maintenance General Technician course. Students explore career opportunities and requirements of a professional aviation mechanic. Students study reciprocating engines, turbine engines, inspection, instruments, fire-protection, electrical, lubrication, ignition, and starting systems.

CTE Standards and Benchmarks	FAA FAR Part 147
15.0 Perform basic reciprocating engine skills--The student will be able to:	
15.01 Inspect and repair a radial engine.	App. D, I, A, 1. Level 1
15.02 Overhaul a reciprocating engine.	App. D, I, A, 2. Level 2
15.03 Inspect, check, service, and repair reciprocating engines and engine installations.	App. D, I, A, 3. Level 3
15.04 Install, troubleshoot, and remove reciprocating engines.	App. D, I, A, 4. Level 3
16.0 Perform basic turbine engine skills--The student will be able to:	
16.01 Overhaul a turbine engine.	App. D, I, B, 5. Level 2
16.02 Inspect, check, service, and repair turbine engines and turbine engine installations.	App. D, I, B, 6. Level 3
16.03 Install, troubleshoot, and remove turbine engines.	App. D, I, B, 7. Level 3
17.0 Perform engine inspection--The student will be able to:	
17.01 Perform Powerplant conformity and airworthiness inspections.	App. D, I, C, 8. Level 3
18.0 Maintain engine instrument systems--The student will be able to:	
18.01 Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems.	App. D, II, A, 9. Level 2
18.02 Inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and r.p.m. indicating systems.	App. D, II, A, 10. Level 2
19.0 Maintain engine fire-protection systems--The student will be able to:	
19.01 Inspect, check, service, troubleshoot, and repair engine fire-detection and extinguishing systems.	App. D, II, B, 11. Level 3
20.0 Maintain engine electrical systems--The student will be able to:	
20.01 Repair engine electrical system components.	App. D, II, C, 12. Level 2

CTE Standards and Benchmarks	FAA FAR Part 147
20.02 Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices.	App. D, II, C, 13. Level 3
21.0 Maintain lubrication systems--The student will be able to:	
21.01 Identify and select lubricants.	App. D, II, D, 14. Level 2
21.02 Repair engine lubrication system components.	App. D, II, D, 15. Level 2
21.03 Inspect, check, service, troubleshoot, and repair engine lubrication systems.	App. D, II, D, 16. Level 3
22.0 Maintain ignition and starting systems--The student will be able to:	
22.01 Overhaul magneto and ignition harness.	App. D, II, E, 17. Level 2
22.02 Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components.	App. D, II, E, 18. Level 2
22.03 Inspect, service, troubleshoot, and repair turbine engine electrical starting systems.	App. D, II, E, 19a. Level 3
22.04 Inspect, service, and troubleshoot turbine engine pneumatic starting systems.	App. D, II, E, 19b. Level 1

Course Number: AMT0776

Occupational Completion Point: B (2 of 2)

Aviation Maintenance Powerplant Technician 2 – 450 Hours – SOC Code 49-3011

Course Description:

The Aviation Maintenance Powerplant Technician 2 course is designed to build on the skills and knowledge students learned in the Aviation Maintenance Powerplant Technician 1 course. Students explore career opportunities and requirements of a professional aviation mechanic. Students study fuel, metering, induction, airflow, cooling, exhaust, reverser, propellers, inductors, auxiliary power units, FAA Powerplant Rating licensing, employability skills, and entrepreneurship.

CTE Standards and Benchmarks	FAA FAR Part 147
23.0 Maintain fuel metering systems--The student will be able to:	
23.01 Troubleshoot and adjust turbine engine fuel-metering systems and electronic-engine fuel controls.	App. D, II, F, 20. Level 1
23.02 Overhaul carburetor.	App. D, II, F, 21. Level 1
23.03 Repair engine fuel metering system components.	App. D, II, F, 22. Level 2
23.04 Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel-metering systems.	App. D, II, F, 23. Level 3
24.0 Maintain engine fuel systems--The student will be able to:	
24.01 Repair engine fuel system components.	App. D, II, G, 24. Level 2

CTE Standards and Benchmarks	FAA FAR Part 147
24.02 Inspect, check, service, troubleshoot, and repair engine fuel systems.	App. D, II, G, 25. Level 3
25.0 Maintain induction and engine airflow systems --The student will be able to:	
25.01 Inspect, check, troubleshoot, service, and repair engine ice and rain control systems.	App. D, II, H, 26. Level 2
25.02 Inspect, check, service, troubleshoot, and repair heat exchangers, superchargers, and turbine engine airflow and temperature control systems.	App. D, II, H, 27. Level 1
25.03 Inspect, check, service, and repair carburetor air intake and induction manifolds.	App. D, II, H, 28. Level 3
26.0 Maintain engine cooling systems--The student will be able to:	
26.01 Repair engine cooling system components.	App. D, II, I, 29. Level 2
26.02 Inspect, check, troubleshoot, service, and repair engine cooling systems.	App. D, II, I, 30. Level 3
27.0 Maintain engine exhaust and reverser systems--The student will be able to:	
27.01 Repair engine exhaust system components.	App. D, II, J, 31. Level 2
27.02 Inspect, check, troubleshoot, service, and repair engine exhaust systems.	App. D, II, J, 32a. Level 3
27.03 Troubleshoot and repair engine thrust reverser systems and related components.	App. D, II, J, 32b. Level 1
28.0 Maintain aircraft propellers--The student will be able to:	
28.01 Inspect, check, service, and repair propeller synchronizing and ice control systems.	App. D, II, K, 33. Level 1
28.02 Identify and select propeller lubricants.	App. D, II, K, 34. Level 2
28.03 Balance propellers.	App. D, II, K, 35. Level 1
28.04 Repair propeller control system components.	App. D, II, K, 36. Level 2
28.05 Inspect, check, service, and repair fixed-pitch, constant-speed, feathering propellers, and propeller-governing systems.	App. D, II, K, 37. Level 3
28.06 Install, troubleshoot, and remove propellers.	App. D, II, K, 38. Level 3
28.07 Repair aluminum alloy propeller blades.	App. D, II, K, 39. Level 3
29.0 Maintain unducted fans-The student will be able to:	
29.01 Inspect and troubleshoot unducted fan systems and components.	App. D, II, L, 40. Level 1
30.0 Maintain auxiliary power units-The student will be able to:	
30.01 Inspect, check, service, and troubleshoot turbine-driven auxiliary power units.	
31.0 Demonstrate knowledge of Federal Aviation Administration Powerplant licensing requirements--The student will be able to:	
31.01 Explain the requirements for obtaining FAA authorization to take the FAA Powerplant examinations.	

CTE Standards and Benchmarks	FAA FAR Part 147
32.0 Demonstrate employability skills for an Aviation Maintenance Powerplant Technician (AMT) with an FAA Powerplant rating--The student will be able to:	
32.01 Conduct a job search for an AMT position.	
32.02 Secure information about the requirements for an AMT in a particular firm.	
32.03 Identify documents that may be required when applying for an AMT position.	
32.04 Complete a job-application form correctly.	
32.05 Demonstrate competency in job-interview techniques.	
32.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.	
32.07 Identify or adopt acceptable AMT work habits.	
32.08 Demonstrate knowledge of how to make job changes appropriately.	
32.09 Demonstrate acceptable employee health habits.	
32.10 Demonstrate knowledge of the Federal Law as recorded in (29 CFR-1910.1200).	
33.0 Demonstrate an understanding of entrepreneurship related to opportunities in Aviation Powerplant Maintenance occupations--The student will be able to:	
33.01 Define entrepreneurship.	
33.02 Describe the importance of entrepreneurship to the Aviation Maintenance industry.	
33.03 List the advantages and disadvantages of Aviation Maintenance business ownership.	
33.04 Identify the risks involved in ownership of an Aviation Maintenance business.	
33.05 Identify the necessary personal characteristics of a successful Aviation Maintenance business owner.	
33.06 Identify the business skills needed to operate an Aviation Maintenance business efficiently and effectively.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Classroom, shop, and laboratory activities are an integral part of this program. FAR Section 147.21(e) requires teaching of at least 50 percent of the curriculum in the shop or laboratory. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes found in the industry. Equipment and supplies should be provided to enhance hands-on experiences for students in the chosen occupation.

Special Notes

Required FAA exams include GENERAL written, oral, and practical; AIRFRAME written, oral, and practical; and POWERPLANT written, oral, and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take precedence over other requirements. The FAA specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

"FAA FAR Part 147" identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

- Level 1:** knowledge of general principles
- Level 2:** knowledge of general principles and limited practical application
- Level 3:** knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147: For subjects taught at Level 3, all special tools required to meet "return to service" standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation.

All tools and equipment should be maintained in good working order and be in a condition for safe operation. The types of tools and equipment required for Aviation General, Airframe, and Powerplant teaching include the ones listed below:

Common hand tools, portable tools, precision tools, machine tools, torqueing tools, shop equipment and machinery, specialized tools and equipment, airframe structures, aircraft, airframes, powerplants, propellers, and components of this equipment

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student. Access MyCareerShines by visiting: www.mycareershines.org.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 9.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:

<http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml>