



Strategic Workforce Initiative Proposal

Davis Applied Technology College (DATC), is requesting Strategic Workforce Initiative funding in order to develop a career pathway which includes a stackable credentialing program in partnership with Davis School District (DSD). This program is designed to create courses and pathways that support the growing demand for skilled workers in the Aerospace and Manufacturing Industries.

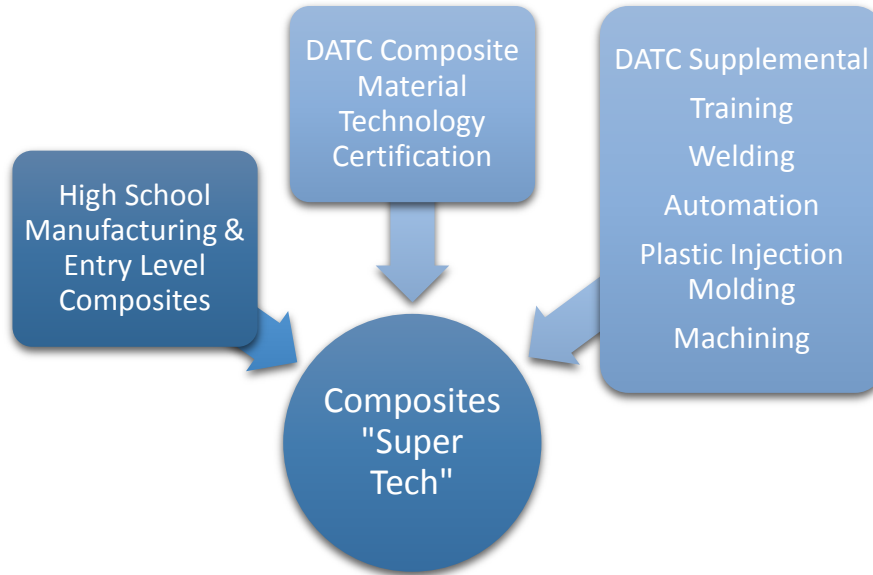
Academic attainment is increasingly important to long-term state economic outcomes. High job growth expected in the next five years for qualified workers in the composites field is creating a critical need. Recruiting and enrolling potential employees into credential programs that will help them become qualified employees as quickly as possible is an overarching need. To meet this need, we must start with students in secondary schools.

Project Description

This proposal is an extension to the Utah Aerospace Pathways (UAP) Program currently in place through partnership with major aerospace and defense companies, Salt Lake Community College, Davis Applied Technology College, Granite School District and Davis School District. The UAP program has been well received by industry partners and the education partners involved have seen great success in the recruitment and training of qualified students in the composites field. In Davis County, the UAP program was designed to allow high school students to work through their respective high schools to achieve manufacturing basics competencies and then transition to the DATC to receive composites manufacturing training.

With this proposal, DATC will expand the UAP concept by working directly with Davis School District to provide the emerging manufacturing and entry level composites manufacturing training directly in the high schools, making the program accessible to more students. This proposal allows students to complete an industry approved certification within the Composite Materials Technology program at the DATC concurrent with their high school enrollment.

DATC proposes a stackable credential program with our secondary schools that will lead to DATC certification in Composite Materials Technology with supplemental training in one or more additional fields. Recognizing that our Aerospace Partners are looking for “Super” Technicians who not only proficient in composites, but also have background and expertise in multiple fields, our project will include extended training opportunities that will provide students with base knowledge in one or more additional manufacturing processes including; Industrial Robotics, UAV/Drone Technology, Additive Manufacturing, CNC Machining, Welding Technology, Automation Technology, and Plastic Injection Molding Technology.



Stackable Sequence of Credentials

DATC will provide funding for an instructor to teach in two high schools in Davis County during the 2017/2018 year with a possible expansion to a third school in Davis County in 2018/19. The first two high schools to participate will be Woods Cross High School and Syracuse High School which covers the Northern and Southern region of Davis County. DATC will work in conjunction with DSD to develop curriculum which may include online curriculum.

Completion of emerging manufacturing and entry level composites at the high school will allow students to transfer directly into the Composite Materials Technology course at the DATC. With the entry portion of this training behind them, juniors and seniors will benefit from an accelerated entry at the DATC which will allow opportunities to add the extended training options onto their Composite Material Technology Certification. This extended training will increase their hiring potential with industry partners.

This sequence of courses is designed in a way that students can attain DATC certification of completion at or near the same time they graduate high school, leading to talent ready to enter employment and career opportunities with Aerospace Industry partners which will expand capacity to meet regional workforce needs.

DATC has academic agreements in place with Weber State University (WSU), LDS Business College and Utah State University (USU) which provide opportunities for students to articulate many of our courses for credit at these institutions. In addition, students who complete the DATC program with a certificate can articulate 30 credit hours towards an Associate of Applied Science degree at all three institutions. These academic agreements and stackable credentials offer a number of entry and exit points allowing students to apply for employment opportunities at every stage, with advanced certificates and degrees leading to higher wages.

STRATEGIC WORKFORCE ON-RAMPS

Davis School District High School Program
 Manufacturing Principles 1
 Composite Materials Technology 1



Jobs
Production Operator
 Wage range \$9 - \$15 per hour
 50 openings per year with a 1.6% growth rate
Machinists
 Wage Range \$15 - \$21
 170 Openings per year with 2.5% annual growth rate

DATC Composite Materials Technology Program
 Advanced Certificate, National Certified Composite Technician (CCT)
 Options to add supplemental courses in additional fields



B.S. Engineering Degree



Jobs
Materials & Process Engineers
 Wage Range: \$36 - \$50 per hour
 180 Openings per year with a 2.2% growth rate
Vocational Educators
Quality Control & Inspection



Jobs
Associate Production Operator
Composite Technician
Aircraft Maintenance Technician
Repair and Part Finish Technician
 Wage Range \$18 - \$27 per hour
 240 Openings per year with a 1.9% growth rate

A.A.S Degree
 Weber State
 Utah State
 LDS Business College



Jobs
Engineering Technicians
 Wage Range \$19 - \$30 per hour
 10 - 30 Openings per year with a 1-2% annual growth rate

Employment Information Source: Utah Occupational Projections Report 2012-2022, DWS

DATC Composite Materials Technology certification include the opportunity to receive national certification as a Certified Composites Technician through American Composites Manufacturers Association (ACMA). Due to the advanced equipment available at the DATC to train students, job opportunities have expanded from Composite Technicians to also include Autoclav Operators and Trainers.

The Composite Materials Technology program at the DATC prepares students to work in industries such as aerospace, automotive, bridge and building, marine, sporting goods, and parts assembly. This program starts with basic composites and progresses through advanced composite materials, techniques, and procedures. Here, the student will prepare themselves in an industrial setting. Those who complete this program will be prepared for entry-level employment as a Composite Technician. Students will also be taught industry standards concerning safety, composite terminology, hand lay-up, and composite inspection and repair.

Composite Materials Technology Stackable Credentials Course Description

This pathway program will lead to State approved courses at the secondary level aligned to identify industry skill, refined coursework at the post-secondary level that address skill requirements of industry partners with curriculum that includes performance proficiencies required by industry that assesses the quality of student skill attainment, clearly articulated pathways between secondary and postsecondary, increased enrollment of high school students in composites and integrated stackable credits that begin in secondary school. In addition, the pathway provides stackable credentials to an A.A. S degree at three higher education institutions.

Step 1.) High School Program Completion

These programs are designed to build core competencies and prepare students to complete DATC competency based programs at an accelerated pace. Courses will cover manufacturing principles, including; safety, habits & skills, equipment use, lean manufacturing principles, as well as basic composite materials technology. DSD will utilize instructor lead, online and project based learning techniques.

Manufacturing Principles 1 Composites Technology 1

Step 2.) Davis Applied Technology College Composite Materials Technology Certification

This 870 hour program is designed to prepare students for entry level positions within the composites field which includes Aerospace, Medical and Sporting Goods Industries. Program includes training in soft skills.

COMP 0000 Composites Materials Technology Orientation	BTEC 1030 Operating Systems & Email Application
COMP 1010 Composites Basics	BTEC 1031 Word Processing Fundamentals
COMP 1055 Mold Preparation and Tooling	WKSJ 1400 Workplace Relations
COMP 1155 Non-Vacuum and Vacuum Bag Fabrication	COMP 1910 Composite Part Testing
COMP 1210 Prepreg Material Laminations	COMP 2010 Alternative Composite Processes
COMP 1400 Core Materials	COMP 2110 Filament Winding
COMP 1520 Composites Repair and Advanced Repair	WKSJ 1500 Job Seeking Skills
COMP 1611 Part Finish	COMP 2210 Autoclave Processing
DRFT 1045 Blueprint Reading	COMP 2500 Composite Materials Tech.Final Project
COMP 1710 Blueprint Reading for Composites	COMP 2805 Special Projects 1
COMP 1810 Composite Machining	Math 1000 Math 1

Step 3.) A.A.S. Degree through WSU, USU and LDS Business College

Currently, DATC students are able to articulate the Composites Technology Certificate towards 30 credit hours towards an A.A. S. Degree at LDS Business College. This grant will support curriculum development within DATC Composite Materials Technology Program that will increase program hours from 870 to 900 allowing students to articulate program hours into 30 credit hours towards an A.A. S. Degree at WSU and USU beginning July 2017.

B.S. Degree

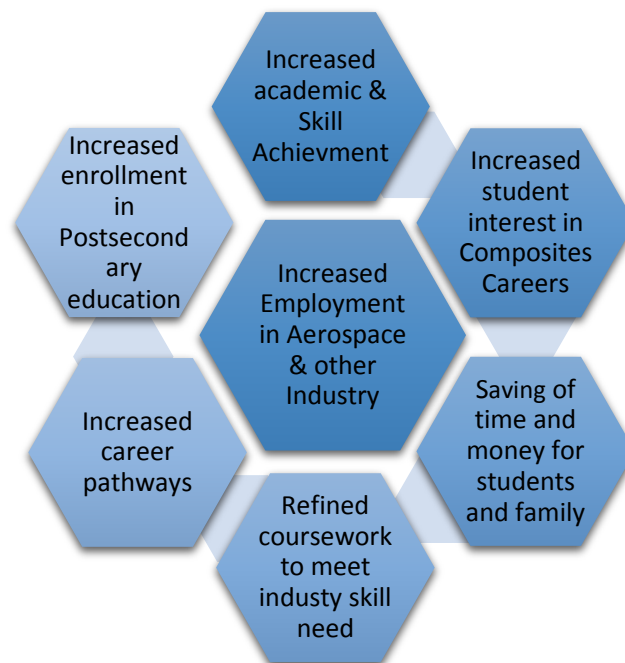
Academic agreements that are in place with WSU, USU and LDS Business College allow DATC students who wish to pursue a B.S. Degree to receive credit for several of the basic courses taken at the DATC. Students who earn an A.A.S. Degree at USU may also articulate their hours into a B.S Degree at USU.

Expected Secondary Student Outcomes

Composites Materials Technology Pathway Program					
	DSD Manufacturing & Composites Course	DATC Composite Materials Program	DATC Extended Options	DATC Certification Completion Rate	Job Placement
Yearly Projected Secondary Student Enrollment	40	30 - 70	30	89%	97%

We project that we will have 40 high school students who have participated in pilot coursework in the high schools by spring 2018. It is anticipated that seventy-five percent of these students will continue into the Composite Materials Technology Program at the DATC during their Junior and Senior year. These numbers do not include students who are also participating in UAP. With the introduction of the UAP program, DATC increased the number of secondary students enrolled in Composite Materials Technology, from forty-one to seventy-seven students. We anticipate this project will further increase interest, while also providing an estimated 30 students with the extended training options.

Additional Benefits of Pathway



Project Timeline

During year one, DATC will work with DSD to retrofit Syracuse High and purchase initial equipment in order to implement the full Manufacturing Principles 1 and Composites Technology 1 courses. At Woods Cross High Manufacturing Principles 1 will be implemented during year one, with retrofit and equipment being purchased in year two for full implementation and addition of Composite Technology 1 course. DATC will increase the Composite Technology Program to 900 hours July 1, 2017. Academic agreements are already in place with WSU, USU and LDS Business College to allow for articulation of 30 credit hours towards the A.A.S. degree. This will further enhance the pathway program. In addition, we hope to begin working with Industry Partners to add internship opportunities. The Utah Aerospace Pathways Grant has opened the door for Industry partners to recognize the value that internships bring to our students and their potential employees.

Industry Needs

Utah has one of the highest concentrations of advanced composite companies in the world and it is projected to grow. At present, approximately 123 Utah companies are active in the industry accounting for at least 10,000 jobs. One of the major concerns facing this industry in Utah and elsewhere is the shortage of talented technicians necessary to supply the industry.

Wage data provided online by the Utah Division of Workforce Services indicates that in related job classifications such as “Team Assemblers”, “Machinists” and “Composites Technicians” project annual openings of over 500 with an average wage of \$18.75 per hour or \$39,000 per year. While the data available does not specifically identify an Aerospace manufacturing position, the entry-level workforce pay expectations are a reliable amalgamation.

According to the Utah Employment Forecast Survey, the overall anticipated job growth within the Aerospace and Defense Cluster is projected at 14,176.

The Governor’s Office of Economic Development, 2015 annual report shows that aerospace and defense cluster continued growing through 2014. The sector represents almost 2.51 % of all state wages, with average wages about 198 % higher than the Utah average wage. The definition used for aerospace and defense cluster has been broadened to ensure that it includes advanced manufacturing firms that serve all high technology industries in the state. Advanced manufacturing is a key industry drive for aerospace and defense and all strategic clusters.

Industries requiring employees skilled in Composite Materials Technology include; Aerospace, Manufacturing, Sporting Goods and Medical. A sampling of jobs within these industries are listed below.

- Aerospace parts and assemblies
- Automotive parts development
- Bridge and building renovation projects
- Composite sales and manufacturing
- Marine boat manufacturing
- Quality control and inspection
- Research and development assignments
- Sporting goods, skiing and bicycle component fabrication

Key Partners

Partner	Partner Functions
Post-Secondary	<ul style="list-style-type: none">• Weber State University• LDS Business College• Utah State University
Secondary	<ul style="list-style-type: none">• Davis School District (DSD)
Industry Trade Association(s)	<ul style="list-style-type: none">• Utah Manufacturing Association (UMA)

Industry	<ul style="list-style-type: none"> • Boeing • Hill Air Force Base • Albany • Orbital ATK Corporation • Composites One • KIHOMAC • Janicki Industries • Lifetime
Government Agencies	<ul style="list-style-type: none"> • Utah State Office of Education (USOE) • Governors Office of Economic Development (GOED)

DATC Composite Materials Technology Program Student Employment Placements

FY 2014 – FY 2016

Employer Name	FY 2014	FY 2015	FY 2016	Total
Applied Aerospace Structures			1	1
Orbital ATK	63	117	12	192
Boeing	7	1	1	9
Composite Engineering Inc.			1	1
Contour Composites		1		1
DATC	1			1
DPS Skis		1	1	2
Emotis			2	2
ENVE Composites		1	1	2
Hexcel		1		1
Hill Air Force Base	4	75	14	93
Albany	2	4	11	17
KIHOMAC			3	3
United States Air Force			1	1
Wasatch Composite Analysis		1		1
Zero Manufacturing			1	1
Zodiac US Corporation	2			2
Grand Total	78	203	48	328

Project Budget

Program Expenses	Year One	Year Two	Year Three	Total
High School Instructor (WXHS)	9,000	18,000	18,000	\$ 45,000
DATC Adjunct Instructor (SHS)	22,000	22,000	22,000	\$ 66,000
DATC Equipment				
High School Equipment & Retrofitting *	76,000	95,000	95,000	\$266,000
High School Curriculum Development				
DATC Curriculum Development				
Online Instruction Costs - Manufacturing Principles	32,000	32,000	32,000	\$96,000
Textbooks/software				
Instructor Training		3,000	3,000	\$6,000
Training Supplies/Consumables	5,000	10,000	10,000	\$25,000
Other				
Total Program Expense	\$144,000	\$180,000	\$180,000	\$504,000

*** Equipment**

- Oven, freezer, layup table for pre-preg
- Saws, sanders, drills, and hand/portable power tools for production and finish
- Filament winding machine
- Freezer
- Molds (4-5 mold types with 5-6 of each, some metal and some composites)
- Scales
- Solvent recycling apparatus
- Sprayup booth
- Storage racks (2-4 with capability of storing 4 rolls each)
- Vacuum pump (2 portable on roller tables)

*** Retrofitting**

- Positive pressure-introduced prep room, with refurbishment for oven and freezer needed for consumable storage, layup, production, and finish. May include: electrical overhead for each table, elephant trunks for exhaust vented to outside over all tables, house air lines over all tables, with drying on lines, vacuum lines at each table, washing facility, etc.
- Production (used for cutting, sanding, etc., needs to be negative pressure to surrounding rooms, should have house vacuum with elephant trunks, exhaust hoods/dust collection for VOC, etc.)
- Solvent and resin storage areas
- Material and project storage areas