CACHE COUNTY
SCHOOL DISTRICT

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November 20, 2018

Subject: Letter of Support for the AM STEM Program
To: Nomination Committee

The Cache County School District has been and continues to be a strong supporter and advocate for the Automated Manufacturing (AM STEM) program. This program started through an existing partnership with local industry partners and their request to help them build a highly trained workforce in automated manufacturing. This partnership included all eight Bear River Region high schools, Bridgerland Technical College (BTECH), Utah State University, and the local industry leaders.

This successful AM STEM program has all the critical elements needed to sustain itself. It uses 21st Century curriculum that is updated every year with our industry partners. Parents are involved in the program. They can see the benefits of their students starting a technical career while in high school and continuing this training in a post-secondary setting. Students are using career relevant equipment sponsored by BTECH and our industry partners. The education pathway is in place to start the AM STEM training in high school, complete advanced certificates at Bridgerland, and transfer these certificates for credit at Utah State University to complete associate and/or bachelor degrees. Lastly, our industry partners are vested in this program. Their experts help train our teachers every year and assist with updating the curriculum.

In the past, career and technical (CTE) course were perceived as a place where students might get dirty or where students who were not planning to go to college went to learn job skills. The AM STEM program is one of many highly successful programs that are rebranding CTE. Industry leaders are recognizing the value of these STEM Industry certification programs and are searching out our trained student and providing them with high salary and quality of life employment.

Michael R. Liechty

Michael Liechty
Deputy Superintendent
Cache County School District

November 19, 2018

To Whom it may Concern,

My name is Mike Quayle and I work as Manager of Human Resources at Autoliv, a position I have held for over 20 years. In that time, I have had the opportunity to work in many Autoliv Facilities. While working at our Tremonton, Utah Facility, it became very apparent that automating our processes would be key to future. However, we had one big problem- finding the talent that we needed to engage in and sustain that initiative.

In 2012 the only College in Utah, that I could find, that offered any Automation/Robotics training was Utah Valley University (UVU), in Orem Utah. At that time, they only offered an Associate Degree and their campus was over 100 miles from the Tremonton Plant, making it impossible for employees to work and attend school there.

My solution to the problem at that time was two-fold. First find a college we could recruit from that had Students with the educational base we needed and second develop a local stream of talent to meet our demands for the future.

The school that could meet our current needs was Indiana State University, in Terre Haute Indiana. In 2013 we started bringing students in for internships and hiring them the following year.

At the same time, I started approaching the local colleges about the prospects of helping us by putting together a program where our talent needs could be met locally.

Bridgerland Technology College took the request and ran with it. They started working on the curriculum and obtaining the resources needed to create the course work necessary to meet our needs.

Our goal was to develop this into a 4-year degree and Bridgerland was willing to work with local Universities to meet this goal. Bridgeland would provide the associate level course-work and the Universities and Bridgerland collaborating to provide the additional course-work. We now have students that will graduate in the spring of 2019 with a Bachelor’s degree in Automation/Robotics.

With Bridgerland taking the lead, we now have 2 Technical Colleges in our backyard, teaching robotics with another getting ready to start. Additionally, we also have two Universities that now offer a 4-year degree in Automation, and another an Associates.

To ensure that they keep the talent pipeline full they have also sponsored AM STEM classes in Cache, Rich and Box-Elder Counties. These courses are taught on-line via canvas prior to school and are very well attended.

Having had the opportunity to have a front row seat on this Automation ride, I cannot express enough appreciation to Bridgerland Technology College for the support that they have been to Autoliv. I'm aware that this Automation/Robotics program has gained a lot of attention in the State of Utah and Bridgerland has been a corner stone in putting this program in place.

This collaborative experience over the last 6 years with Bridgerland has not only been personally rewarding but has created a stream of local talent that is meeting not just the needs of our 6 locations in Weber and Box Elder Counties, but industry as a whole in Northern Utah!

With Bridgerland's help Autoliv will work to stay competitive in a global market. Not only will it benefit Autoliv and other Manufacturers in the area, but it will also make Utah an even more attractive location to open future manufacturing sites and provide more jobs for the citizens of our great State.

Thank-you Bridgerland Technical College!

Sincerely,

Mike Quayle

BRIDGERLAND TECHNICAL COLLEGE

Electronic Engineering Technology 900 Hour Certificate

BRIDGERLAND TECHNICAL COLLEGE

Automated Manufacturing 900 Hour Certificate

COMPLETE 900 HOUR CERT + GET A JOB!

Associate of Applied Science (AAS)
Technology Systems Emphasis (Recommended)
(Any 900 hour Bridgerland certificate counts 30 credit hours upon completion)

Bachelor of Science
Technology Systems Controls Emphasis
Up to 18 credits from the Bridgerland Controls Engineering Technology Certificate can articulate

BRIDGERLAND TECHNICAL COLLEGE

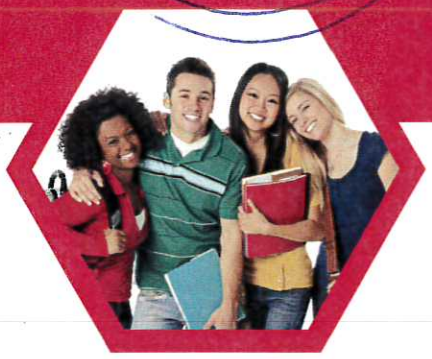
Controls Engineering Technology 600 Hour Certificate

(Pre-requisite: Automated Manufacturing)

The following articulate to the USU Bachelor's:

- Industrial Networking/lab
- Programmable Logic Controllers 2
- Human Machine Interface HMI
- Industrial Integration Capstone
- 90 hours of industrial robot programming electives
- 90 hours of Vision Systems, IRVision, DCS, & Servos

GO TO WORK!
STUDENTS CAN EXIT AND ENTER EDUCATION PATH AT MULTIPLE POINTS



BRIDGERLAND TECHNICAL COLLEGE

Courses taken at the high school that can count toward elective credit hours.

Each 1/2 credit counts for 15 hours toward the certificate.

Students must obtain a B grade or better for a course to count.

All courses must meet State of Utah Department of Education standards and objectives for the courses to count.

CIP	COURSE TITLE
14.1340	PLtW Computer Integrated Maniuf
14.1390	PLtW Engineering Design & Devel
14.1350	PLtW Aerospace Engineering
14.1330	PLtW Civil Engineering & Arch
14.1320	PLtW Digital Electronics
14.1300	PLtW Intro to Engineering Design
14.1310	PLtW Principles of Engineering
48.0501	Machinist Tech/CNC (Drill Press)
48.0503	Machinist Tech/CNC (Lathe)
48.0508	Welding Technician, Entry
48.0510	Welding Technician, Inter. Level
48.0512	Welding Technician, Advanced
15.1520	Industrial & Agricultural Tech
52.0417	Computer Technology
11.0702	Exploring Computer Science

CIP	COURSE TITLE
14.141	EbD Technology & Society
14.1411	EbD Technological Design
14.1412	EbD Engineering Design
15.0321	Electronics 1
15.0322	Electronics 2
15.0323	Electronics 3
14.1551	Engineering Principles 1
14.1552	Engineering Principles 2
15.1510	Engineering Technology
15.1540	Information & Comm Tech
14.3611	Manufacturing Principles 1
14.3612	Manufacturing Principles 2
15.1560	Manufacturing Technology
14.4231	Robotics 1
14.4232	Robotics 2

Automated Manufacturing 900 Hour

Core Courses		Course Hours
ELEC 1001	Computer Tools for Technology	60
AMAR 1000	Basic Workplace Safety	15
AMAR 1100	Automation Technician Basics	45
AMAR 1200	Basic Electrical Theory and Wiring	60
AMAR 1300	Industrial Mechanics	90
AMAR 1400	Fluid Power Hydraulics	60
AMAR 1450	Fluid Power Pneumatics	60
AMAR 1500	Electrical Motor Controls	90
AMAR 1550	Electric Motors and Drives	60
AMAR 1600	Programmable Logic Controllers 1	90
AMAR 1650	Sensors	60
AMAR 1700	Introduction to Industrial Robotics	60
Elective Courses		**Course Hours**
ELEC 1003	Electronics Assembly & Soldering	30
ELEC 2051	Microcontrollers 1	60
WELD 1050	Welding Overview	90
WELD 1060	IAM Welding Certifications	90
MACH 1701	Machine Shop	90
AMAR 1150	3D Modeling	60
AMAR 1410	Fluid Power Hydraulics Advanced	30
AMAR 1460	Fluid Power Pneumatics Advanced	30
AMAR 1800	Introduction to Advanced Composites	60
AMAR 1900	HVAC Refrigeration	90
Require Instructor Approval Electives		
AMAR 2810	Industry Related Certifications/Seminars	15-60
AMAR 2820	Automation Final Project	60
AMAR 2830	Automation Final Project 2	60
AMAR 2840	OJT/Instructor Aid	60
AMAR 2850	OJT/Instructor Aid 2	60
AMAR 2900	Special Applications	30-180
Totals:		

Core Hours: 750
Elective Hours: 150
Grand Total: 900

Courses available at local high schools

Electronic Engineering Technology 900 Hour

Core Courses		Course Hours
ELEC 1001	Computer Tools for Technology	60
AMAR 1100	Automation Technician Basics	45
AMAR 1000	Basic Workplace Safety	15
ELEC 1003	Electronics Assembly & Soldering	30
AMAR 1200	Basic Electrical Theory and Wiring	60
ELEC 1021	Electronics Fundamentals DC	90
ELEC 1022	Electronics Fundamentals AC	90
ELEC 1111	Semiconductor Devices	120
ELEC 1130	Digital Fundamentals	120
ELEC 2041	Communication Circuits	60
ELEC 2051	Microcontrollers 1	60
ELEC 2110	IPC-J-STD-001 Certification	30
ELEC 2120	IPC-A-610 Certification	30
Elective Courses		**Course Hours**
AMAR 1150	3D Modeling	60
ELEC 1200	Practical Electronics/Electrical Troubleshooting	120
AMAR 1500	Electrical Motor Controls	90
ELEC 2052	Microcontrollers 2	60
ELEC 2062	Mobile Robotics Platforms	60
ELEC 2064	Aerial Robotics Platforms	60
ELEC 2066	Basic Drone Technology and Piloting	30
ELEC 2080	Programmable Logic Devices	120
ELEC 2200	Introduction to Optics, Photonics and Lasers	120
Require Instructor Approval Electives		
AMAR 2810	Industry Related Certifications/Seminars	15-60
ELEC 2811	Electronics Final Project	60
ELEC 2812	Electronics Final Project 2	60
ELEC 2821	OJT/Instructor Aid	60
ELEC 2822	OJT/Instructor Aid 2	60
ELEC 2901	Special Applications	30-180
Totals:		

Core Hours: 810
Elective Hours: 90
Grand Total: 900

Courses available at local high schools

Controls Engineering Technology 600 Hour

Core Courses		Course Hours
AMAR 2000	Industrial Networking Basics	60
AMAR 2050	Vision Systems Basic	30
AMAR 2100	Programmable Logic Controllers 2	90
AMAR 2150	Human Machine Interface (HMI) Programmir	90
AMAR 2200	Industrial Networking Lab	30
AMAR 2800	Industrial Integration Capstone Assembly	90
Suggested Elective Courses		**Course Hours**
AMAR 2250	Servo Motors and Drives	30
AMAR 2300	Programmable Logic Controllers 3	90
AMAR 2350	Troubleshooting Industrial Controls	30
AMAR 2400	SCARA Robot Basic Programming Cert	45
AMAR 2450	Motoman Basic Programming Certification	45
AMAR 2500	Fanuc Basic Programming Certification	45
AMAR 2550	FANUC ROBOGUIDE Simulation Software	45
AMAR 2600	FANUC iRVision Operation & Programming -	15
AMAR 2650	FANUC Dual Check Safety	15
AMAR 2700	Fanuc Advanced Programming	45
AMAR 2750	Robot Maintenance	30
Totals:		

Core Hours: 390
Elective Hours: 210
Grand Total: 600

USU Articulated Courses

TEE 2400 Industrial Networking 3 Credits
AMAR 2000 Industrial Networking, AMAR 2200 Industrial Networking Lab

TEE 3370 Industrial Robotics 3 Credits
AMAR 2500 Fanuc Basic Programming Certification
AMAR 2700 Fanuc Advanced Programming

TEE 3380 Advanced PLC 3 Credits
AMAR 2100 Programmable Logic Controllers 2

TEE 3390 HMI 3 Credits
AMAR 2150 Human Machine Interface (HMI) Programming

TEE 2020 Computer Integrated Mf Systems 3 Credits
AMAR 2050 Vision Systems Basic, AMAR 2250 Servo Motors and Drives
AMAR 2600 Fanuc iRVision, AMAR 2650 Fanuc Dual Check Safety
OR
AMAR 2300 Programmable Logic Controllers 3

ASTE 4900 Senior Project 3 Credits
AMAR 2800 Industrial Integration Capstone Assembly
NOTE: Students must be registered in both the USU & Bridgerland course to get credit for both.

Some classes may be eligible for transfer from other institutions. Discretion is left to the Department Head as to whether or not a class or work experience may be eligible. Additional competency testing may be required.

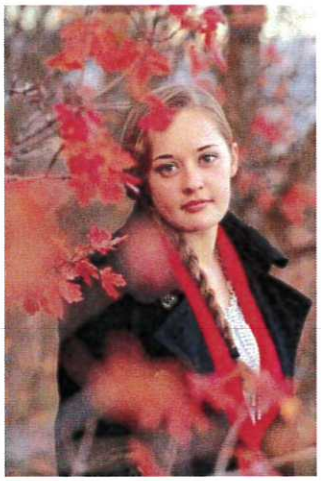
John Robinson

"The Bridgerland AM STEM certification has given me the knowledge and skills to work at a job that is far better than most for my age. Getting a job that allows me to work with equipment that I learned about in class was well worth the extra effort.

This program first caught my interest when I was a junior in high school. I was forced to be a driver on one of the school's robotics team. I didn't want to do it, but after the first day of competition I fell in love it. The following year I was a team captain for the robotics team, as well as enrolling in an early morning certificate program from Bridgerland that taught about everything I was interested in such as robotics and technology, as well as other sciences.

I enjoyed the hands on learning experience. We were able to learn by working with modern technology instead of reading about outdated technology from a textbook. We were actively involved with all of the modules we were being taught, which was my favorite part.

This fall I will have an AAS in General Technology from USU, and in the spring of 2020 I plan on graduating with a BS in Technology Systems from USU. I am also a Cadet in the AFROTC and plan to serve our wonderful country after graduating from college."



Emma Larson

Earned her AM STEM Academy 900 hour certificate shortly after returning from missionary service for the LDS Church. Emma gave the valedictory address during graduation commencement at Mt Crest High School, and then started the AM STEM program that summer.

"Thanks to this certificate, I have been able to gain employment at an STEM outreach program for kids. It has also allowed me to realize my passions and continue my education in Mechanical Engineering.

I attended a Charter School throughout elementary school and receive an excellent education, but my exposure to STEM was very limited. In high school, I joined a VEX robotics club and realized that I loved robotics. Bridgerland provided the resources that I needed to further study that field along with many others. That experience inspired me to study Mechanical Engineering at USU where I am currently enrolled. I chose to study at Bridgerland because I had great interactions with staff members, and heard about the wonderful resources available there. I would like to become a teacher and give kids the opportunity to realize their passions, but I am confident that my experience at Bridgerland has allowed me to see the breadth of my options and be prepared to succeed in whatever I choose.

Mike Turner

Mike decided to go above and beyond the basic 900 hour certificate and earn the 1410 hour Industrial Robotics Advanced certification. His dedication and hard work had some of the top integration companies in Utah trying to hire him before he had finished his certificate.

"Obtaining this certification from Bridgerland has provided me an industry recognized skill set that I wouldn't have been able to gain elsewhere. It gave me an incredible head start on my career path.

Early on, when I started the program at BATC, Autoliv was looking for Automation Technician interns. I was fortunate enough to be able to get that job, working weekends at Autoliv and going to school during the week. The internship provided me an opportunity to be able to apply what I was learning in a real-world environment. Later, near the end of my program at Bridgerland, I participated in our departments senior capstone project. I designed and completed a project using everyday equipment that is used in this field. I was fortunate enough to be approached by Setpoint Systems, inc. from Ogden Utah with a job offer. I am now working as a Jr. Controls Engineer at Setpoint. That value of being able to show off my skill set to potential employers was immeasurable.

Bryken Jensen

"I have been employed at Autoliv for 2 months. In my time at Autoliv I have already seen my schooling from Bridgerland help me. It was the best choice I made to go to Bridgerland as a high school student to start on my AM STEM certificate. I started my job at Autoliv the week after I graduated high school. It was my Bridgerland training that made me eligible for my interview. Without my Bridgerland training I would not have received my job. I am currently working on their PM (preventative maintenance) crew. I work on their weekend shift when production isn't running so that we can go in when the machines are shut down and PM the machines. We play a critical part in keeping the plant running efficiently. I have seen how each and every class at Bridgerland has helped me in the work field.

My time at Bridgerland has definitely been challenging for me, but now that I am employed in my field, I can see how direct the translation of school and the actual work place really is. Bridgerland gives a very accurate representation of what the work place is like in their school settings. This is one of the things that I loved about the program. When I started at Autoliv there were a few of the classes that I have taken that stuck out a little bit more than the rest like pneumatics, introduction to robotics, and PLCs (Programmable Logic Controllers). I get a great sense of accomplishment when I can find ways to transfer what I learned at school to how it is actually being used in the work force. Moving forward, I am going to take my education to the next level, transfer my AM STEM certificate, and continue my education at Utah State University."

Utah State University

Associate of Applied Science (AAS)
General Technology

			Cr	Prerequisites / Notes
General Education Requirements			**16 minimum credits required**	
Communication Literacy			**3**	
☐	ENGL 1010	Introduction to Writing (CL1)	3	or ENGL 2010
Math Requirement			**4**	
☐	QL	Quantitative Literacy	4	MATH1030 (QL); MATH1050 (QL); STAT1040 (QL); STAT1045(QL); BUSN1050 or MATH1020 will be accepted; take a QL class if planning to pursue a BS degree
Breadth Requirements			**9**	
☐	BAI	Breadth American Institutions	3	APEC 1600 or ECN 1500 preferred
☐	BSS or BHU	Breadth Social Science or Humanities	3	
☐	BPS or BLS	Breadth Physical or Life Science	3	
Technical Requirements for Degree			**17 minimum credits required**	
Core Courses (Human Relations and Communications)			**6**	
☐	BUSN 2320	Small Business Management for CTE	3	
☐	BUSN 2200	Business Communications	3	Prereq – ENGL 1010
Designated Electives from an Emphasis Area			**11**	

Emphasis Options

General Business Emphasis

☐	BUSN 2010	Financial Accounting	4
☐	BUSN 2020	Managerial Accounting	4
☐	BUSN 2050	Business Law	4
☐	BUSN 2390	Organizational Behavior	3
☐	BUSN 2590	Business Ethics & Social Responsibility	2
☐	BUSN 2800	Computerized Accounting	2
☐	BUSN 2988	Special Problems (Entrepreneurial Thought)	1-3
☐	CMST 1020	Public Speaking (BHU)***	3
☐			

Design and Creative Arts Emphasis****

☐	ART 1010	Exploring Art (BCA)	3
☐	ID 1750	Design in Everyday Living (BCA)	3
☐	LAEP 1030	Intro to Landscape Architecture (BCA)	3
☐	OPDD 1700	Outdoor Prod Design & Dev Prof Sem	1
☐	TEE 1010	Communications Technology	3
☐	TEE 1030	Material Processing System	3
☐	TEE 1200	Computer-Aided Drafting & Design*	3
☐	TEE 2030	Wood-based Mfg. Systems	3
☐			
☐			
☐			

Technology Systems Emphasis

☐	ASTE 2250	Occupational Experience	1-6
☐	BUSN 2390	Organizational Behavior	3
☐	BUSN 2590	Business Ethics & Social Responsibility	2
☐	CMST 1020	Public Speaking (BHU)***	3
☐	TEE 1010	Communications Technology	3
☐	TEE 1020	EPT Systems Control Technology	3
☐	TEE 1030	Material Processing System	3
☐	TEE 1040	Construction and Estimating	3
☐	TEE 1200	Computer-Aided Drafting & Design*	3
☐	TEE 2020	Computer-Intg. Mfg. Systems	3
☐	TEE 2030	Wood-based Mfg. Systems	3
☐	TEE 2220	Civil Engineering & Architecture**	3
☐	TEE 2230	Advanced Material Processing System	3
☐	TEE 2300	Electronic Fundamentals (QI)	4

Allied Health Systems Emphasis

☐	BIOL 1500	Anatomy and Physiology (BLS)	3
☐	BIOL 2320	Human Anatomy	4
☐	BIOL 2420	Human Physiology	4
☐	FCHD 1500	Human Dev. Across the Lifespan (BSS)	3
☐	HEAL 2020	Emergency First Response	3
☐	HEP 2500	Health and Wellness	2
☐	NDFS 1020	Science & App of Human Nutrit (BLS)	3
☐	NURS 1008	Medical Terminology	2

ATC 900 hour Certificate or Certificate of Proficiency/Completion	**30 credits (credits transferred at time of graduation application)**
Degree Total	**63 minimum credits required**

*EDDT1040 or EDDT1070 can be substituted; **EDDT1100 can be substituted; ***CMST1330, CMST2110 or CMST2120 can be substituted; **** ART2400, ID1790, LAEP1350, OPDD1750, FCSE1140, FCSE2040 or a lower level art or interior design course can be substituted upon advisor permission. **Course substitutions are reviewed on a case-by-case basis. Please work with Academic Advisor for course selections.**

Updated – 04/17/2017

UtahStateUniversity

Bachelor of Science (BS)
Technology Systems

			Cr	Prerequisites / Notes
General Education Requirements			**30 minimum credits required**	
Communication Literacy			**3**	
☐	ENGL 2010	Intermediate Writing (CL2)	3	
Breadth Requirements			**12**	
☐	BSS	Breadth Social Science	3	
☐	BLS	Breadth Life Science	3	
☐	BCA	Breadth Creative Arts	3	
☐	Breadth	Exploration Course	3	
Depth Requirements			**15**	
☐	CI	Communications Intensive	3	**(Can be fulfilled w/ASTE 3050)**
☐	CI	Communications Intensive	3	**(Can be fulfilled w/CMST 3250)**
☐	QI	Quantitative Intensive	3	**(Can be fulfilled w/TEE 2300)**
☐	DHA	Depth Humanities and Creative Arts	3	
☐	DSS	Depth Social Sciences	3	
Technical Requirements for Degree			**36 minimum credits required**	
Core Courses			**21**	*9 credits double count in both Depth Req & Core Courses
☐	ASTE 3050	Technical & Professional Comm (CI)	3*	
☐	ASTE 3440	Science, Tech & Mod Science (DSC)	3	
☐	ASTE 4250	Internship	4	Variable credits – increase if more Upper Division is needed
☐	ASTE 4900	Senior Project	3	
☐	CMST 3250	Organizational Communication (CI)	3*	
☐	TEE 2300	Electronics Fundamentals (QI)	3*	
☐	TEE 3000	Hazard Recognition & Control	3	
Designated Electives from an Emphasis Area			**15**	

Emphasis Options

Information and Computer Technology Emphasis

☐	TEE 3050	Network Administration	3
☐	TEE 3400	Computer Automation	3
☐	TEE 3510	Advanced Server Administration	3
☐	TEE 3710	Advanced Hardware	3
☐	TEE 4710	Security and Digital Forensics	3

Product Development Emphasis

☐	FCSE 4040	Advanced Clothing Studies	3
☐	OPDD 4420	Dig Design Tech for Outdoor Prod I	3
☐	OPDD 4430	Dig Design Tech for Outdoor Prod II	3
☐	TEE 2020	Computer-Integrated Mf Systems	3
☐	TEE 2230	Advanced Materials & Proc Systems	3

Robotics, Automation, and Controls Emphasis

☐	TEE 2020	Computer-Integrated Mf Systems	3
☐	TEE 2400	Industrial Networking	3
☐	TEE 3370	Industrial Robotics	3
☐	TEE 3380	Advanced PLC	3
☐	TEE 3390	HMI	3

Technical Management Emphasis

☐	MGT 3250	Introduction to Human Resource Mgt	3
☐	MGT 3510	New Venture Fundamentals	2
☐	MGT 3520	New Venture Management	2
☐	MGT 3540	New Venture Financing	2
☐	MGT 3700	Operations Management	2
☐	MGT 4720	Production Planning & Control	2
☐		Internship or MGT Elective	2

ATC 900 hour Certificate or Certificate of Proficiency/Completion	**30 credits (credits transferred at time of graduation application)**
AAS General Technology Degree (or other approved elective credits)	**33 credits**
Degree Total	**120 minimum credits required**

Course substitutions are reviewed on a case-by-case basis.
Please work with Academic Advisor for course selections.

Updated – 04/13/2017