

QUINEBAUG VALLEY COMMUNITY COLLEGE

Program Review

COLLEGE SELF-STUDY REPORT

College: Quinebaug Valley Community College
742 Upper Maple Street
Danielson, CT 06239

Discipline:

Report Prepared by:

Stephen LaPointe, Director
Advanced Manufacturing
College Discipline Member

Stephen LaPointe
Signature

5/23/18
Date

Jodi Clark, Assistant Director
~~Sara Van Orden, AVSC~~
College Discipline Member

Jodi Clark
Signature

6/21/2018
Date

College Discipline Member

Signature

Date

College Discipline Member

Signature

Date

Report Submitted To:

Alfred Williams

Dean's Name

Alfred Williams
Signature

6/20/18
Date

Carlee Drummer

President's Name

Carlee Drummer
Signature

6.22.18
Date

Report Copy for Institutional Effectiveness

Received by: Office for Institutional Effectiveness

Donna Sohan
Name

Don Sohan
Signature

6/21/18
Date

Quinebaug Valley Community College

Academic Affairs Baseline Program Review

1) Mission Statement; Program/Discipline Outcomes

- a. List the mission statement of your program or discipline. **QVCC Advanced Manufacturing Mission Statement: "To provide students a blend of theoretical and practical experiences in advanced technologies relevant to the needs of our community's manufacturing companies"**
- b. List the Program or Discipline Outcomes. **Advanced Manufacturing Certificate (34 credits). This certificate is a pathway to an Associate Degree in Technology Studies. Thirty of the credits transfer directly to that degree.**

2) Historical Enrollment Data

- a. Provide five years of enrollment data and three years of retention data. List on ground and online (if any) separately.

AMTC Enrollment and Graduates Statistics

12/8/2017

Year	# Enrolled	# of Certificates	# of NIMS Credentials	% retention
Spring 2013	52	33		63%
Spring 2014	52	44		85%
Spring 2015	30	20	2014/15 (97)	66%
Fall 2015		1	2015/16 (80)	
Spring 2016	35	21	2016/17 (96)	60%
Spring 2017	35	22		63%
Fall 2017	22	11	2017/17 (55)	50%
Fall 2017 Spring 2018	44	TBD	2017/18 (75)	
OVERALL	225	152	403	68%

b. Analyze the data and draw conclusions. **The first four years of the program took place at Ellis Technical High School with the only availability for a night cohort. The unemployment benefits period in the beginning allowed students some income as they pursued training in a new career. Enrollment in the first two years was high largely due to the unemployment benefits extended through the completion of the certificate.. Unemployed students did not have to worry about benefits running out before they completed training. That changed when the benefit period was reduced. Our biggest challenge to grow enrollment has been the perception of manufacturing in general. The words dark, dirty and dangerous are often used. Our original goal to fill our program to capacity was to have 50% supplied by incumbent workers, 25% high school graduates and the other 25% general public looking to change careers.**

In year five QVCC opened its newly constructed Advanced Manufacturing Center and it has become a game changer. Not only do we have the opportunity to showcase this beautiful facility to interested students and the public, but it allows us the flexibility of classes both for credit and non-credit. The center is being utilized from 8 am. To 9 pm. five days a week. Overall retention is sixty-eight percent and some students who did not complete have obtained employment. We consider this a success that goes untold in any of the data recorded on various reports. Not included in the data is the number of students taking one or two classes that would eventually become full time students in the certificate program.

3) Curriculum Review

a. List all courses specific to your program/discipline that are in the catalog or have been offered anytime in the last three years. Note the semester each course was taught.

QVCC offers a two semester cohort model that starts at two different times. Our nighttime cohort starts in Fall semester and has a capacity of 50 students. We then offer a daytime cohort that starts in the Spring semester and has a capacity of 25 students. This allows interested students the ability to register for classes each semester. Spring of 2017 was the first year of this approach since we were limited sharing a technical high school. We only had the ability to run night classes. In the past a student had to wait until Fall each year to take the program. Another reason was to have graduating students available for our local business and industry to hire throughout the year. QVCC has a rotating schedule of paid internships and direct hires with the new schedule.

1st Semester Courses:

MFG 105	Manufacturing Math II
MFG 124	Blueprint Reading I
MFG 151	Drill Press & Saw
MFG 152	Grinding I
MFG 153	Benchwork
MFG 154	Lathe I
MFG 155	Milling I
MFG 156	CNC I

2nd Semester Courses

MFG 125	Blueprint Reading II
QUA 114	Principles of Quality Control
CAD 220	Solidworks
MFG 254	Lathe II
MFG 255	Milling II
MFG 256	CNC II

Is there a syllabus on file in the Academic Affairs Office for each course specific to your program that includes course outcomes and processes for assessment? **YES**

If the answer is "NO," list the courses below that lack outcomes and assessment; provide a plan and timeline for completing this work.

b. List any online classes in your program/discipline. How often are each offered, and what are the plans for future online classes? What is the rationale for this plan? **There are no online classes offered at this time.**

4) Program/Discipline Delivery Strategies

Is the program/discipline semester course sequence listed in the catalog? **YES** Has the sequence been followed for the current and past two academic years? **YES** How does the sequence serve part-time students? **We offer some of the classes to part time students outside of the manufacturing cohort classes. The Milling, Lathe, Grinding, Bench work, Drill Press & Saw and CNC are taught together to utilize the lab time to coincide with each other and the projects they have in lab. Students who do not have the time to devote to a 30 hour a week program can take Blueprint, Math, Quality and Solidworks (CAD) to lighten the load when shop classes are convenient. Do you coordinate course offerings with other programs? We are presently looking into changing the certificate to allow more a la carte offerings. This allows engineering students to take some of the courses offered such as Soloidworks (CAD), Quality, Introduction to Lean etc.**

5) Trends

a. What have been two major national and/or state trends specific to your program/discipline during the current and past two academic years?

1. There continues to be a resurgence in manufacturing and the skilled employees needed to fill retiring workers is a top priority. Electric Boat, Pratt and Whitney and Sikorsky are all experiencing the same issues. Connecticut has a boom in manufacturing and training in the various disciplines is critical. The Apprenticeship model has gained momentum. This is a driving force in continued workforce development.

2. There is a lack of qualified instructors to teach various disciplines. There are plenty of individuals with skills but the lack of a teaching degree remains an issue. When trying to persuade possible instructors from business and industry to switch to education, wages are always a concern. Part time night adjuncts has been our most successful approach. The system office is presently reviewing a job description of a Manufacturing Technology Instructor that can help with this problem.

b. What are the emerging trends that will dominate during the next three years? (Do not include enrollment or retention issues here.) Emerging trends starting to surface are the need for short-term non-credit programs to meet specific needs of business and industry. This hurts overall workforce development by reducing the necessary skills needed to replace the experienced aging workforce. Various businesses such as mold shops, job shops and tool and die cannot succeed with short-term training. There are fundamentals that are the building blocks for students to acquire to become beneficial skilled machinists. Students who are looking for career changes are more concerned with the quickest route to employment.

c. What transfer articulation agreements exist with other institutions? (List each and include expiry data.) What are your future plans for transfer articulation? The classes in the certificate programs are offered at other colleges. This allows all of our courses to transfer to any of the schools offering advanced manufacturing or mechatronics

6) Institutional Barriers

a. What are the major institutional barriers to success that students experience in your program or discipline? (Focus on teaching, learning, and curricular issues.) The biggest barrier remains the lack of qualified instructors meeting the degree requirements to teach in higher education. The instructors we have in place have over 35 years of experience in the various disciplines. There could be more time spent with professional development to help with classroom management. Our Advisory Board supports our decision to spend more time in the shop teaching hands-on skills and fundamental building blocks of the trade.

b. What is your plan to address these issues? The system office has started discussions to alleviate this problem by reviewing options for alternative minimum requirements to teach in higher education.

7) For programs only: Advisory Board

a. List current members with contact information. List dates of last two meetings. Append minutes for those meetings.

AMTC Advisory Board Meeting 6/29/2017 8 am. QVCC Betty Hale Mechatronics Lab

AMTC Advisory Board Meeting 11/16/2017 8am. QVCC W207 Presidents Conference Room

Minutes are attached with the list of members and contact information

b. Discuss the three most important ideas or feedback you have received from your Advisory Board. How have you responded to that input?

1. Our Advisory Board supports teaching the fundamentals needed in the trade. Some schools are bypassing those critical building blocks and moving directly to CNC operators.

2. There showed an immediate need for some type of Automation Technician training to fulfill the needs of most facilities and their maintenance departments. QVCC created a similar 30 credit two-semester certificate titled Mechatronics Automation Technician to meet those needs. This program has great support from business and industry and enrollment is good.

3. The Advisory Board understands our struggle with finding instructors in the various disciplines. They also agree that a person from industry has the hands-on skills and knowledge to fulfill any instructor positions we seek. They are not concerned over the levels or degrees a person might have, just discipline specific knowledge. The system office is in process of creating a new job description with new criteria.

c. Discuss input that you have received that you are unable to respond to and why. **QVCC has been able to meet our business partner demands. Our team of instructors will be reviewing the student handbook and the projects that are required to complete the various classes. There is such a broad need for specific disciplines, our latest Advisory Board gave us a few ideas on how to improve certain areas to meet their needs.**

8) Instructional Support

What are your current classroom, media, and IT needs? How will those needs change in the future? What support will be necessary to meet those needs? **Sharing a technical high school the first four years led to some IT issues and a poorly designed classroom to teach in. Our newly constructed Advanced Manufacturing Technology Center has a smart classroom that includes the latest technologies. There are pop-up computer work stations to do Solidworks CAD instruction on. When not in use the computer drops into the desk allowing students to utilize the desk top area for normal classroom activities. In the past it was always difficult to get appropriate times in the colleges computer lab for CAD training. Our classroom was designed specifically for the manufacturing students and is in use all day every day for both credit classes and non-credit offerings**

9) Budget

What is your current budget and how is it spent? Are there any crucial budget needs you can forecast now that will emerge in the next three years? **The current operating expense budget for the Manufacturing Program is \$36,500. This covers all of the materials used for projects and all consumable items such as drills, end mills, cutters and inserts. The CAMI grant was a huge help financially in hiring the appropriate staff and Educational Assistants as we expanded the program with both day and night cohort models. A new position, Manufacturing Technology Instructor, is in the process of approval at the system office. This will alleviate some of the scrambling to fill the many disciplines of instruction. QVCC is also in the process of restructuring the Advanced Manufacturing Certificate by combining some classes and eliminating or replacing others. This change will not impact the budget.**

10) Public Disclosure

Does program/discipline information published on the website provide sufficient information to allow students and prospective students to make informed decisions about registering for classes within the program/discipline? **YES**

11) Resource requests/suggestions

List resources needed over the next 5 years; financial, physical, personnel
Our biggest concern and immediate need is for a full time faculty or instructor to handle most of the disciplines in the newly formed Mechatronics Automation Certificate. There are many pieces of equipment and devices that need training to fully utilize the equipment to its potential. QVCC is planning to change our strategy by having separate advisory boards for each. The Advanced Manufacturing Certificate has many new projects and lean and continuous improvement strategies are in place. The shop has the necessary equipment and small tooling to meet industries demands for training.

The Mechatronics certificate will require more testing and diagnostic equipment to keep up with the change in technologies. The system office is in the process of creating a new manufacturing instructor position that will help alleviate the need to hire so many different adjuncts. Our present need is for 45 adjunct contracts in manufacturing and mechatronics in one year

12) Final Comments

The Advanced Manufacturing Certificate program has achieved so many success stories over time. QVCC 's most important goal has always been to get all of our students employed in careers in manufacturing to benefit our community. Although we have achieved a ninety-five percent employment rate for graduates, we still struggle to fill the program with enrollment. A statewide marketing campaign called "Make It Here" had no effect on boosting enrollment. We continue to use social media in our local area to promote manufacturing. Our student testimonials are still the best method to portray that message. With the need for our skilled graduates at Electric Boat and Pratt & Whitney we are confident that all our students will be employed for the next ten years.

QVCC Advanced Manufacturing Technology Center

Advisory Board

- Jeff Paul, Whitcraft Corp. 860-974-0786
- Jeff Koehl, Spirol International 860-774-8571
- Ed Chamberland, Gentex 508-943-3860
- Larry Acquarulo, Foster 860-630-4502
- Ray Coombs, Westminster Tool. 860-564-6966
- Daryl Racine, Silgan Dispensing 401-767-5139
- Mike Tripp, The Lee Co. 860-399-6281
- Shannon Haddad, General Cable 860-465-8709
- John Beauregard, Eastern Workforce Investment Board 860-859-4100
- Elsie Bisset, Town of Killingly Economic Development 860-779-5350
- Pete Obuchowski, Xuare Inc. 860-886-3908
- Chris Jewell, Collins & Jewell Company 860-887-8813
- Joe Loffredo, Micro Precision Group 860-423-4575
- Howard Jenkins, Electric Boat 860-433-9386
- Kelli Vallieres, Sound Manufacturing/EAMA President 860-388-4466
- Tracy Ariel, Board of Regents Director of the AMTC's 860-723-0605
- Andrew Teft , Kocek 800-420-4673
- Anita Santerre, International Paper 860-963-6217

College Personnel

- Dr. Carlee Drummer, President 860-932-4129
- Paul Martland, Dean of Administrative Services 860-932-4124
- Alfred Williams, Dean of Academic Affairs and Student Services 860-932-4172
- Stephen LaPointe, Director of the AMTC 860-932-4111
- Jodi Clark, Advanced Manufacturing Educational Specialist 860-932-4128
- Sandra Gould, QVCC CAMI Data Specialist 860-932-4178
- Andrew Morrison, CAMI Outreach Specialist 860-932-4360

Advanced Manufacturing Advisory Board Agenda

June 29, 2017 8 am Room N106

Topics Advanced Manufacturing Certificate

- Advanced Manufacturing Certificate Graduation Spring 2017, employment numbers
- Fall 2017 2nd semester cohort, continuing students
- Fall 2017 1st semester enrollment numbers
- Overall NIMS certificates awarded
- NIMS AMTC Facility Accreditation/ MET-TEC Companies for inspection
- High School Partnerships
- Manufacturing Endowment Fund and Haas Scholarships
- Manufacture Your Future October 27th 2017
 1. Business participation
 2. Workshop ideas
- Manufacturing Pipeline to date 102 plus 16
- Press release

Topics Mechatronics Automation Technician Certificate

- Certificate approval Board of Regents
- Course Descriptions
- Classes already completed
- Fall 1st Semester enrollment
- Instructors

Promotion and Perception Ideas

- Business Open House schedule
- Overall enrollment
- Lean Manufacturing Certificate
- Website

QVCC Advanced Manufacturing Technology Center
Advisory Committee Meeting
06/29/17

The Advanced Manufacturing Technology Center Advisory Committee met at 8:00 a.m. in the Betty Hale Mechatronics Laboratory.

Those present included:

- Carlee Drummer, QVCC President
- Stephen LaPointe, AMTC Director
- Jodi Clark, AMTC Program Assistant
- Paul Martland, Dean of Administrative Service
- Andy Morrison, Interim Director Comm. Outreach & Vet. Services
- Annie Hill, Comm. Outreach & Vet. Services Assistant
- Elsie Bisette, Killingly Economic & Community Development Coordinator
- John Beauregard, Eastern Workforce Investment Board Executive Director
- Jeff Paul, Whitcraft President
- Peter Obuchowski, Xuare Owner/Mechatronics Instructor
- Kelli Vallieres, Sound Mfg. CEO/ EAMA President
- Daryl Racine, Silgan Dispensing Systems Production Supervisor
- Larry Acquarulo, Foster Corp. President/CEO
- Rick Dancause, International Paper
- Tracy Ariel, Advanced Manufacturing & CT ECO Director

Steve LaPointe called the meeting to order at 8:10 a.m.

Advanced Manufacturing Certificate Program: graduates, job placement, enrollment

Steve reported that the AMTC awarded 22 certificates in the Advanced Manufacturing program for spring 2017. The class started with 33 students. The goal for the fall cohort is 50 students. All but one of the graduates has been placed with an advanced manufacturing company.

The daytime cohort that started in spring 2017 saw 25 students enroll, with 15 now enrolled to return in fall 2017. Steve has set a goal of 18 daytime students for fall 2017. Ideally, the total number of students in the daytime and evening programs would equal 75, but current numbers are closer to 50.

NIMS

In the 2016-2017 school year, the AMTC awarded 96 NIMS credentials. This was one of the highest number of NIMS credentials so far, which Steve attributed to the number of students who further developed their skills in paid internships. QVCC and Naugatuck combined to earn 66% of the community college system's NIMS certifications statewide. Tracy Ariel noted that many of Naugatuck's NIMS certifications were earned by incumbent workers who returned to school specifically to attain a NIMS credential.

High School Partnerships

Steve would like to see more technical high school students earn credit toward manufacturing programs via QVCC's Prior Learning Assessment exams.

QV's manufacturing math and blueprint reading are being taught in area high schools. Steve recently learned that 42 students in Putnam took the blueprint course. Killingly is exploring offerings in Solidworks.

Manufacturing Endowment Fund, Haas Scholarships

The endowment fund is currently at \$550,000 and has a goal of reaching \$1 million. Plans are underway to establish criteria for scholarships awarded through the endowment fund. Steve said financial need will be part of the criteria and the application will include a short essay question.

Jodi Clark reported on distribution of the \$25,000 scholarship grant from the Gene Haas Foundation. Students have three opportunities to earn \$100 scholarships - registration for first semester, registration for second semester, and making Dean's List. Graduates with a 4.0 GPA earn a \$250 scholarship. So far, the AMTC has awarded \$10,100 in scholarships, leaving \$14,900 in the Haas scholarship account. Jodi plans to apply for the award again.

Manufacture Your Future Event October 27th 2017

Manufacture Your Future will bring roughly 250 high school students to QVCC for a day of manufacturing-themed activities and interactions with companies. At Jeff Paul's request, Jodi explained that QV provides student transportation and utilizes personal connections with teachers and guidance counselors to recruit interested students. The event is intended for seniors, but many schools send sophomores and juniors, too.

Companies are encouraged to propose workshops for the event. Steve anticipates four workshops running at 30 minutes each.

Jeff Paul suggested that EAMA companies help engage high school students in September and encourage them to attend Manufacture Your Future the next month. This led to a broader discussion of youth engagement efforts, including open houses and marketing materials.

Manufacturing Pipeline Update

The pipeline program has graduated nearly 120 students, including 17 who graduated the day prior to the advisory meeting (June 28). Three more cohorts will graduate by the end of 2017.

Steve reported that as part of its obligation to hire 20% of pipeline graduates, Electric Boat interviews students in each cohort prior to graduation. At Kelli Vallieres' request, Steve confirmed that EAMA companies are also welcome to interview pipeline students.

Steve clarified that not all pipeline students go to Electric Boat. Steve remains committed to servicing local companies. Much of EB's successful recruitment of pipeline graduates is wage driven.

Kelli noted that at Sound Manufacturing, two out of four employees who left for Electric Boat now want to return. The group discussed the potential for EAMA companies to offer internships to students on the pipeline waiting list.

Mechatronics Certificate Program

The Mechatronics Automation Technician certificate program has been approved by the Board of Regents. A Hydraulics & Pneumatics class had 18 students. Most were sponsored by local companies. Industrial Motor Controls is underway with 13 students. Fall 2017 will be the first semester in which a full slate of Mechatronics classes will be offered. Thirty credits earned can transfer to a Technology Studies degree.

Instructors

Steve noted that it remains challenging to find qualified instructors for manufacturing programs, particularly during the daytime. Steve recently ran an ad announcing open positions and hopes companies may be able to suggest qualified employees.

Non-credit

Steve asked Andy Morrison to share an update on new offerings in the non-credit arena. Andy reported that QVCC has asked him and Annie Hill to help establish more non-credit classes and programs for local companies, including manufacturers. The first new class, Intro to CNC Machining, will begin on July 17.

Lean Manufacturing

Steve announced that he is exploring the possibility of offering a certificate in Lean Manufacturing, which had been offered before at QVCC and remains on the books. Jeff Paul noted that a Lean Manufacturing certificate would only work if companies buy into the concept. Jeff suggested targeting non-manufacturers, like Day Kimball Healthcare, who might benefit from the principles of Lean Manufacturing.

EAMA Update

Kelli shared word that EAMA is currently collecting data from its members to determine common interests in training programs and classes.

The video competition is expanding and could involve a regional competition with companies in the New Haven Manufacturing Alliance.

High school students can now earn credentials for pre-apprenticeship related courses. Tracy Ariel shared word that a \$600,000 grant to promote the College Connections program could help high school students spend two hours per day taking classes at an Advanced Manufacturing Technology Center.

The CT ECO program received legislative recognition and awaits further developments regarding state funding.

The EAMA annual meeting is scheduled for August 9 at the Norwich Holiday Inn. The recent strategic session identified membership engagement as an area of focus for EAMA. Steps will be taken to engage members in a business capacity.

Staffing Agencies

Steve asked for the committee's thoughts on their companies' use of staffing agencies. Steve is often approached by staffing agencies interested in working with AMTC graduates, but Steve would rather deal directly with the companies looking to hire the grads.

Larry Acquarulo acknowledged that Foster Corp. uses staffing agencies on the technical side of their business and not so much on the manufacturing or machine operating side. Sound Manufacturing used to do all their hiring through staffing agencies, but for the past two years, they've primarily hired through the STEP Up and Ready For Work programs.

Daryl Racine acknowledged that Silgan Dispensing Systems uses staffing agencies for all hires. International Paper has a corporate policy prohibiting the use of staffing agencies.

NIMS Accreditation

Steve informed the committee that the AMTC is exploring NIM accreditation for the facility.

Final Comments

Rick from International Paper discussed the difficulty in retaining maintenance employees, but he is hopeful the new Mechatronics program could help. Rick believes that at a fast enough pace with financial incentives attached (AAA Maintenance Mechanics can earn \$28-29 per hour), employees could successfully complete the Mechatronics certificate. International Paper offers a tuition reimbursement program, and Rick said he will look into getting some of the company's managers to visit the AMTC.

Adjournment

Steve LaPointe thanked everyone for the continued support of the QVCC Advanced Manufacturing Technology Center. The meeting adjourned at 9:45 a.m.

Quinebaug Valley Community College Advisory Board Agenda

11-16-2017 8 am.

Room W207

Advanced Manufacturing Center

- Manufacture Your Future 2017 update (Jodi)
- Program stats
- Daytime Cohort
- Instructors
- Paid Internships
- Students for hire
- Curriculum changes, ideas
- Intro to Lean, GD&T, Metrology, Mastercam Credit courses
- Intro to Manufacturing Pipeline EWIB (Jodi)

Mechatronics Automation Technician Certificate

- Program Stats
- Instructor support going forward
- Class schedule and times Spring 2018
- Math for Electricity and Electronics and PLC's Spring 2018

Non Credit Course offerings for manufacturing

- Intro to Wire EDM (Newly formed) Ideas?
- Intro to CNC (Already ran 45 hour)
- NIMS Geometric Dimension & Tolerances Trainer Workshop (Andy)

AMTC Advisory Board Meeting November 16, 2017

Location: Quinebaug Valley Community College, W207

Called to Order: 8:02am

Adjourned: 9:44a

Present: Steve LaPointe, Jodi Clark, Sandy Gould, Mike Tripp, Jeff Paul, Daryl Racine, Carol LaBelle (for John Beauregard), Ed Chamberland, Peter Obuchowski, Paul Martland, Chris Eber, Elsie Bissett, Ray Coombs, Hank Hague

Guests: Josh Nason, Deb Rimkus, Jakob Spjut, Annie Hill, Ron Williams, Andy Morrison, Mark Foisey

Absent:

Agenda Topic: Manufacture Your Future

Presenter: Jodi Clark

Discussion:

- QVCC held their fourth annual Manufacture Your Future event this October. There were 172 students from 11 high schools-Ponagansett High School from Rhode Island attended for the first time this year and enjoyed it. We plan on continue to cross state lines for high school outreach, and are hoping to have Bay Path Tech School from Massachusetts join us next year.
- There were 4 workshops at this year's event, and we were able to purchase a Baxter robot this year thanks to a grant, so instead of borrowing one this year we were able to use our very own.

Agenda Topic: Program Updates

Presenter: Steve LaPointe

Discussion:

- The CAMI grant has ended, totaling roughly 1.6 million dollars. The equipment purchased from the grant will be a big benefit to the program for a long time. Most recently, a 321 Vision system was purchased for the metrology lab. The mechatronics certificate in particular received support by the CAMI grant.
- We have awarded another 100 NIMs this semester, with a 97% of attempts passed. A recent survey of business questions the importance of NIMs credentials, but they are beneficial to the student and validates what we are doing on the skills side.
- This semester we had a Bay Path student who was able to test out (Prior Learning Assessment/PLA) of the first semester of the Advanced Manufacturing Certificate program and jump right in to the second semester. He tested yesterday and passed all 4 of his NIMs. Technical High School outreach is extremely important for the field and the program. We continue to be the only college pursuing this avenue of recruitment.
- The employment rate remains at 95%. Our students are scooped up faster than they can graduate the program
- We will be graduating 13 this Fall. The continuing students will be ready for internships starting during December break into their Spring semester. Businesses will come to speak with them and meet them one on one to choose an intern that fits best.

Agenda Topic: Certificate/Curriculum Change ideas

Presenter: Steve LaPointe

Discussion:

- We would like to change the Advanced Manufacturing Certificate program's first semester by combining Grinding, Benchwork, and Drill Press and Saw into one 3 credit Intro to Basic Manufacturing course. We would also like to change Blueprint Reading I into a 3 credit course and move portions of Blueprint Reading II into it's curriculum, leaving room for some GD&T in Blueprint Reading II. This would equal less classes in the first semester and result in less instructors. The second semester would stay the same except we would remove Quality Control.
- From an academic side, this will work best because it will eliminate a lot of repetition among the three courses and also make a class like Blueprint Reading I easier for a non-AMTC student to take now that it would be a three credit class.
- The floor was opened up for discussion and the Advisory Board was able to pinpoint what was important to them as a business: blueprint reading, using an edgefinder, being able to follow instructions—repeating steps over and over in practice so that they don't miss steps when in the field. In short, knowing the fundamentals of machining are key to what businesses are looking for in the product they receive from the AMTC program. When the CAMI Outreach Specialist went around speaking to businesses all agreed that the fundamentals were vital.
- Many of the businesses present such as Westminster, Gentex and the Lee Company use a mentor program that is invaluable to preparing our graduates for working on their own in their respective companies. The goal of the certificate program currently is to prepare students with the fundamental knowledge to prepare them to join such a mentor program and be further trained in-house. With the short amount of time of the certificate program, it would be unrealistic to expect more from graduates. Most businesses in attendance agreed that this is their priority when hiring our students. All agreed that our students receive more hands-on experience than any other college/training programs.
- All in agreement that the program will currently remain focused on the fundamentals. Some debate on where GD&T should fall- a little will be added in to Blueprint Reading II, but general consensus is that a full class should take place outside of the certificate program for program graduates/incumbent workers
- Jeff Paul recommends to have a summer session after the program where students come back and have to build something at the end, like a capstone project. This would have to be a non-credit offering and sponsored by the employer. We could also add more NIMs projects to the program.

Agenda Topic: Non-Certificate Course Offerings

Presenter: Steve Lapointe

Discussion:

- Discussion on how to get more industry participation in non-certificate courses such as Lean, GD&T, and now Quality (which may be removed from the certificate program). Every time these classes are offered, we have no students sign up and the classes have to get cancelled. These are courses that industry is asking us to offer so we are disappointed that they are not sending students.
- If each business sent one employee to each class (we can offer one per semester) we would be able to run them. Westminster used to require our graduates to attend one of the non-certificate courses; Whitcraft could do the same, and put it in the hiring contract that employees will be attending certain classes at QVCC.
- Popular consensus is that Metrology should be offered in the Spring, preferable time being 3:30-6:30p. Most employers shifts run to 3:15 or 3:30. Jakob recommends running classes 5-8 so that they match other academic classes and more traditional students can also attend the classes. The 3:30-6:30p timeslot conflicts with most other classes offered at the college.

- Going forward, if this plan works in the Spring we will have a similar conversation for each semester to decide together which class will be offered to ensure industry attendance. There is interest in the future for GD&T, or combo of GD&T and Metrology; the Whitcraft trainer Bill may be available during the Spring semester.
- Steve will write something up; a survey monkey was requested as well so that everyone can be reminded of what they committed to today.
- The question came of who would be paying for this class and if there is funding; we would expect employers to be paying for this, there is funding available to companies for incumbent worker training.

Agenda Topic: Intro to Manufacturing Pipeline EWIB

Presenter: Jodi Clark

Discussion:

- We are on our 11th class currently, which will graduate November 21. As of that date, we will have had 148 graduates from the pipeline and class #12 starts December 4th. 2 students from our last cohort joined the certificate program and tested out of Blueprint Reading I from what they learned in the intro course. One student is already registered from this current cohort for our Spring certificate group.
- Carol Labelle is hoping that EB will be able to specific their needs at tomorrow's Pipeline meeting. The current grant has enough funds left to for a January and February training, and the DOL is giving us some money to be able to do possibly 2 more depending on EB's needs- the welding class at TRCC for instance costs double the other courses, so if EB needs welding there will only be funds for one more course after February. The state is turning its attention to manufacturing because this is where the jobs are, but unfortunately there is no funding at this time, not even federal funding.
- The EB pipeline is good for local businesses because we are getting exposed to possible candidates to hire and send to the certificate program. The benefit with them is that they are actually interested in manufacturing already. The Lee Company hired one of these students and he is now running their most complicated machines and pursuing his mechanical engineering BS.

Agenda Topic: Mechatronics

Presenter: Steve LaPointe

Discussion:

- Businesses answered the call on this one, with 79 seats filled and 29 students pursuing their certificates. We are still the only school in the state to have this program, and we had a potential student come all the way from Middletown to our Open House last night who heard of the program through word of mouth, so word of our program is definitely spreading.
- We are in need of instructors for the Spring semester-Chris from Frito Lay could use employees from his Control Group to teach but they would need academic help as they do not come from an academic background, although they have the experience. Jodi, Deb or Jakob could assist with this portion. The college is aware that many potential instructors for this program are not going to have a 4 year degree and are learning to accept to this. The position would be a state adjunct position with a pay of over \$4000 a semester for one course. Steve will write something up and distribute that.
- Automation is becoming the new thing and it is hard to find qualified employees for this position. Some companies are starting to tap in to recently retired military personnel, who have the mechanic background that can attend some of our classes to buff up.
- Gentex has over 100 robots and are trying to make our courses required training for their employees-specifically they are trying to bring up their operators and train them in this new field. They have several employees currently enrolled in our courses, as does Frito Lay.
- Daryl will reach out to Clay Taylor for possible instruction help- he is employed at Putnam Plastics.

Agenda Topic: Non-Credit

Presenter: Andy Morrison

Discussion:

- If any employees are looking to send Veterans to any courses at QVCC, please send them to Andy or Annie so that they can get their paperwork complete for tuition waivers.
- There will be a Veterans Stand-down in June and businesses are invited to set up at the Job Fair portion of the day to meet potential candidates.
- A new non-credit Intro to CNC was run over the summer that had 6 students in attendance. If a business has 10 employees they would like to go through the course, we can come to you.
- There is possible ISO and OSHA training coming in the future.
- Non-credit also offers the Leadership modules that several present companies have used in the past that have been beneficial to their students.
- There is the potential to hold a NIMs GD&T Train the Trainer course if any businesses are interested in this, we would need 6 students minimum to run this.

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

Manufacturing MFG 105 Manufacturing Math II

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 105	Manufacturing Math II	3	

Prerequisite: MAT 095

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

Second course in manufacturing mathematics. A further study of arithmetic and trigonometric operations applied to manufacturing circumstances. The following geometric entities are studied in detail: the circle, regular and irregular polygons, the right triangle and oblique triangles. The application of angular arithmetic including the study of: angle decimal conversion, the Pythagorean Theorem, Sin, Cos, and Tan functions, and the Law of Sines and Law of Cosines.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 105

Upon completion of this course, the student will be able to

- Add, subtract, multiply and divide angles.
- Convert degrees to decimal degrees and conversely.
- Identify regular polygons and calculate the angles and sides of irregular polygons.
- Compute the length of any side of a right triangle using the Pythagorean Theorem.
- Understand the circle and its parts and apply them to manufacturing related circumstances.
- Write sine, cosine and tangent ratios for any angle.
- Calculate unknown sides and angles for right triangles.
- Perform Sine Bar calculations.
- Use auxiliary lines to for right triangles to solve problems.
- Solve oblique triangle problems using the Law of Sines.
- Solve for sides and angles of oblique angles using the Law of Cosines.

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

Manufacturing MFG 124 Blueprint Reading I

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 124	Blueprint Reading I	2	

Prerequisite: MAT 095

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

This course introduces the basic principles of blueprint reading. Topics include line types, orthographic projections, sketching, dimensioning and tolerancing methods, and notes. Upon completion, students should be able to interpret basic blueprints calculate necessary dimensions and visualize the features of a part.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives -- MFG 124

Upon completion of this course the student will be able to:

- read basic blueprints and identify lines, symbols, and terminology on working drawings and:
- Read basic blueprints.
- Identify lines.
- Identify abbreviations, symbols and terminology on working drawings.
- Interpret basic orthographic projection.
- Calculate basic dimensions.
- Interpret sectional views encountered by individuals in the machining trades.
- Interpret basic geometric, dimensioning and tolerance standards.

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 151 Manufacturing Machinery-
Drill Press and Saw**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 151	Blueprint Reading I	1	

Prerequisite: Completion of Manufacturing Foundations or permission of instructor

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

Course on sawing and drilling machines. Topics covered include use of cutoff saws, use of drill presses, using the vertical band saw, drilling tools, countersinking, reaming and counterboring.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 151

Upon completion of this course the student will be able to:

- Identify the various saws and drill presses used
- Operate band saws and drill presses safely
- Define blade pitch
- Identify drill & saw blade geometry
- Understand the proper set-up of machines
- Understand the proper use of tooling
- Explain the term KERF
- Describe how to select the proper saw blade
- Describe coolants and their effect on drilling and cutting

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 152 Manufacturing Machinery-
Grinding**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 152	Grinding	2	

Prerequisite: Completion of Manufacturing Foundations or permission of instructor

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

Course on the use of various grinding machines. Topics covered include selection and identification of grinding wheels, truing, dressing and balancing wheels, grinding fluids, using the horizontal spindle reciprocating table surface grinder, and using the tool and cutter grinder.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 152

Upon completion of this course the student will be able to:

- Safe use of the grinder
- Properly identify and select the appropriate wheels
- Dress and true the wheel • Proper grinding techniques
- Select appropriate holding devices
- Complete a NIMS part
- Grind to plus or minus .0002 (size and flatness)
- Grind within .0005 (perpendicularity)
- Grind a slot within .001 (parallelism)
- Grind an angle within .002 (angularity)
- Grind an o/d with a spin fixture • Use a cut off wheel
- Learn appropriate measuring techniques (surface plate, surface gage, .0001 indicators, sine bars, and gage blocks)

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 153 Manufacturing Machinery-
Bench Work**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 153	Bench Work	2	

Prerequisite: Completion of Manufacturing Foundations or permission of instructor

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

A basic course in the fundamentals, principles, practices, and tools used in semi-precision and precision layout and in the various tools, methods and procedures for common machine shop benchwork. Topics will include measurement systems, layout principles, hand tools and power tools.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 153

Upon completion of this course the student will be able to:

- Understand and use units of measure
- Identify various types of fasteners
- Understand fits and tolerances
- Understand the difference between semi precision and precision layout
- Understand the proper use of precision measuring tools
- Understand and operate drill presses and saws
- Identify and use hand and power tools
- Understand proper set up of machines
- Use and identify tools for various burring operations

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 154 Manufacturing Machinery-
Lathe I**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 154	Lathe I	2	

Prerequisite: Completion of Manufacturing Foundations or permission of instructor

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

First course in the use of the lathe. Topics include identification of major components of the lathe, tool holders and tool holding, cutting tools, operating the controls, facing and center drilling.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 154

Upon completion of this course the student will be able to:

- Identify all parts of the lathe and their functions
- Understand lathe safety precautions
- Do simple maintenance on a lathe
- Identify and care for 3 and 4 jaw chucks, collets and centers
- Identify tool holders
- Understand feeds and speeds
- Understand tool types, clearances and rakes
- Set up parts, turn, face, center drill and drill
- Understand tapers and perform turning tapers with offset tailstock

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 155 Manufacturing Machinery-
Milling I**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 155	Milling I	2	

Prerequisite: Completion of Manufacturing Foundations or permission of instructor

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

First course on the vertical and horizontal milling machines. Topics to include cutting tools and holders, setups, spindles and arbors, work holding methods.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 155

Upon completion of this course the student will be able to:

- Develop safe work habits while using the milling machine.
- Identify the major components of the vertical milling machine.
- Understand the use of different cutting tools and cutter holders for the vertical milling machine.
- Understand setups for the vertical milling machine.

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 156 Manufacturing Machinery-
CNC I**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 156	CNC I	2	

Prerequisite: Completion of Manufacturing Foundations or permission of instructor

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

First course in computer numerical controlled machinery and programming. Topics include Cartesian coordinates, safe use of CNC equipment, setup and operate a two axis CNC lathe and a three axis CNC machining center, programming and runoff of parts.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 156

Upon completion of this course the student will be able to:

- Understand conversational CNC programming
- Plot Cartesian Points by interpreting blueprint drawings and sketches
- Understand the difference between Absolute and Incremental positioning systems and their relation to Mill and Lathe programming
- Understand the proper set-up of ProtoTRAK CNC machines
- Understand the use of CNC Controls
- Describe Events and Blocks of code

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

Manufacturing MFG 125 Blueprint Reading II

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 125	Blueprint Reading II	2	

Prerequisite: MFG* 124 Blueprint Reading I

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

This course introduces more complex principles of blueprint reading. Topics include surface finish designations, screw thread representation, and identification of injection mold components, welding symbols and Geometric Dimensioning and Tolerancing. Upon completion, students should be able to interpret working drawings at entry-level employment level, calculate necessary dimensions and visualize the features of a part.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 125

Upon completion of this course the student will be able to:

- read basic blueprints and identify lines, symbols, and terminology on working drawings and;
- Read complex blueprints including sections and details.
- Identify injection mold components and establish vocabulary.
- Identify abbreviations, symbols and conventions associated with screw thread terminology.
- Describe a variety of physical characteristics of various AISI steels and aluminum alloys.
- Calculate basic dimensions including unilateral and bilateral tolerances.
- Interpret welding symbols encountered by individuals in the machining trades.
- Interpret basic geometric, dimensioning and tolerance standards.

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 254 Manufacturing Machinery-
Lathe II**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 254	Lathe II	3	

Prerequisite: MFG* 154 Manufacturing Machinery- Lathe I

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

Second course on lathe setup, operation and practices. Topics covered include alignment, turning between centers, and other operations. The student will cut 60 degree external threads, internal threads, tapers, and other thread forms. Use of steady rests and follower rests.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 254

Upon completion of this course the student will be able to:

- Use methods of inspection and measurement
- Turn between centers
- Do simple maintenance on a lathe
- Identify and care for 3 and 4 jaw chucks, collets and centers
- Identify tool holders and carbide inserts
- Cut and measure external and internal threads
- Identify and understand the use of tapers
- Cut snap rings, o rings and parting tool practices

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 255 Manufacturing Machinery-
Milling II**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 255	Milling II	3	

Prerequisite: MFG* 155 Manufacturing Machinery- Milling I

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

Second course on milling setup, operation, and practices. Topics covered include use of offset boring head, side milling cutters, face milling cutters on the horizontal mill, setup and operation of index heads, simple and direct angular indexing, and inspection of gears.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 255

Upon completion of this course the student will be able to:

- Select proper speeds and feeds
- Boring holes using a milling machine
- Safely operate a milling machine
- Select appropriate tooling for milling operations

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing MFG 256 Manufacturing Machinery-
CNC II**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
MFG 256	CNC II	3	

Prerequisite: MFG* 156 Manufacturing Machinery- CNC I

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

Second course in Computer Numerical Controlled programming. A further study of CNC programming for the Lathe and Vertical Machining Center. Topics include setup and tooling, programming simple parts, canned drilling cycles, circular interpolation, special milling cycles, cutter compensation, looping and macros, and special features.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – MFG 256

Upon completion of this course the student will be able to:

- Understand basic G code programming
- Plot Cartesian Points
- Understand Haas Mill Basics
- Understand the difference between Absolute and Incremental positioning systems and their relation to Mill programming
- Understand the proper set-up of CNC machines
- Understand the use of CNC Controls
- Describe the main components of a CNC program
- Describe G and M code functions
- Understand and trouble shoot G code programs in the Haas Mill
- Understand conversational CNC programming

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

Manufacturing QUA 114 Principles of Quality Control

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
QUA 114	Principles of Quality Control	3	

Prerequisite: MFG* 105 , Manufacturing Math I, or equivalent assessment test

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

First course in statistical quality control. Topics covered include determination of process capabilities, estimation of process standard deviation from sample data, use of control charts, calculation of probability of simple events. Student will develop SPC and TQM Manufacturing Plans.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – QUA 114

Upon completion of this course the student will be able to:

- Understand the importance of quality management in the workplace
- Use their knowledge of variation to affect process improvement
- Understand the tools of process improvement
- Understand lean manufacturing basics
- Create and communicate process improvement plans

CHANGES IN CONTENT OBJECTIVES

Date of Change:

QUINEBAUG VALLEY COMMUNITY COLLEGE

COURSE RECORD

**Manufacturing CAD 220 Parametric Design
SolidWorks**

Dept. & Course No.	Course Name	No. of Credits	Date of Approval
CAD 220	Parametric Design SolidWorks	3	

Prerequisite:

CHANGES IN PREREQUISITES

Date of Change:

Catalog Description

This course is an introduction to computer-based design using SolidWorks® parametric 3D CAD software. The course focuses on parametric modeling and topics include: design intent and process, sketching techniques, model development techniques, process-specific modeling, design changes, editing models, patterning and assembly techniques.

CHANGES IN CATALOG DESCRIPTION

Date of Change:

Course Content Objectives – CAD 220

Upon completion of this course the student will be able to:

- **Convert 2D drawings into 3D solid models;**
- **Create 3D CAD part models and assembly models;**
- **Generate detail and assembly drawings from the CAD models.**

CHANGES IN CONTENT OBJECTIVES

Date of Change:

Program Review

Advanced Manufacturing

In 2012, QVCC received funding from the State of Connecticut for the creation of a manufacturing center to encourage new job creation, while developing and strengthening the state's workforce competitiveness. QVCC's Advanced Manufacturing Technology Center (AMTC) trains employees for the 5,000 manufacturers in Connecticut. These companies require skilled and knowledgeable employees. The center is an engine of economic development and a ladder of economic opportunity for students to find jobs in high-skill, high-wage, and high-demand jobs. The mission of the Advanced Manufacturing Center is to offer a variety of credit and non-credit certificate courses in advanced manufacturing for incumbent workers, displaced workers, returning veterans, current community college students, adult education students, and technical/comprehensive high school students.

The manufacturing program began offering classes at H.H. Ellis Technical High School in the fall 2012. The program was limited to offering classes after the high school day. Enrollment averaged 45 students while utilizing the high schools manufacturing equipment.

The 10,000-square-foot AMTC opened in the fall 2016 and is dedicated to providing state-of-the-art training in advanced manufacturing. The opportunity to offer a daytime cohort and the availability of more equipment created the prospect for increased enrollment. The average enrollment has not increased significantly, though, because many of the incentives that were available when the program began are no longer available.

In the spring 2017, the AMTC added a Mechatronics Automation Technician Certificate. This certificate fills a void of employees who assist the design, development and engineering staff. These employees work closely with others to install, maintain, modify and repair mechatronic systems, equipment and component parts

The needs of local manufacturing companies molded the curriculum of the advanced manufacturing program. Students master the fundamentals that are a key to success in a manufacturing job. Students have the ability to earn four National Institute

for Metalworking Skills (NIMS) certificates, which prove competency in different manufacturing areas. Students can continue their education by completing the Advanced Manufacturing Certificate and then transferring thirty credits into the Technology Studies associate degree.

The advanced manufacturing certificate program utilizes a cohort of full-time students who use the AMTC labs to master hands-on skills. In the classroom, emphasis is on understanding the manufacturing process. Each class requires an overall grade of seventy percent to pass. Tutoring is available to students both in the QVCC learning center and individually by instructors and staff in the program. The instructors in the program are experienced teachers who possess years of experience and tactic knowledge of the field. QVCC partner companies feel the program is teaching the foundational seventy percent of knowledge that the students need, to go with the thirty percent that is unique to each manufacturing company.

The AMTC has an advisory board that meets several times a year to discuss trends in manufacturing, events at the AMTC, curriculum changes, non-certificate offerings and other topics of interest to the local manufacturers and the college. The director and staff are also members of the Eastern Advanced Manufacturing Alliance (EAMA). EAMA works with its education and training partners to promote and improve manufacturing careers and the regional manufacturing workforce. College classes are added or modified as the needs of the industry change. This flexibility is vital to maintain partnerships with local companies. As different companies need different skills from our students, the AMTC has been able to offer an apprenticeship model program. This program consist of short-term classes that teach basic skills for immediate employment.

The overall retention of students is sixty-eight percent. Students often begin internships in local manufacturing companies after the first semester. These students often do not complete the program. Retention would be higher if these students were included in the calculation.

The Advanced Manufacturing and Mechatronics Certificates are excellent programs to provide students with a quick pathway to a manufacturing career. The program faces several challenges. Normally adjuncts instructors teaching in the Connecticut Community College system are required to have a master's degree in their

field. The adjuncts who have the expertise in the field often do not have this credential. There is a petition before the Board of Regents to change the requirements of adjunct faculty to an associate degree or certificate in career fields. It is also difficult to find adjuncts interested in teaching as skilled workers are often working overtime because of high demand.

Students that have mastered skills the first semester are offered paid internships at local manufacturers. This can lead to students not completing the program, but instead acquiring full-time employment with that company. Students leaving before completion negatively affect the retention numbers even though the student achieves their objective of finding full-time employment in manufacturing.

QVCC has many first generation college students. These students often have the misconception that manufacturing is still a dark, dirty and dangerous profession. This misconception is changing but is still posing an obstacle when talking to students about a career in manufacturing.

Many local companies committed to sending their employees for training during the creation of the AMTC. Manufacturing companies however, often do not look a year ahead. They only want students after they are trained. If companies would send employees to train, this would increase enrollment significantly.

After review of the AMTC programs, the review committee has the following suggestions:

- The mission statement should include a set of metrics or smart goals to determine if the program is effective. Use both global and local metrics. QVCC cannot improve what it does not measure. Get feedback from the graduates. Highlight what is success to the student, graduation or a job.
- Share curriculum with employers so they can be advocates for the program. Let them know what students are learning during the year.
- Look at other successful college programs. Focus on initiatives to attract students to the manufacturing program.
- Discontinue sending out interns at the end of the first semester. It might be better if students were closer to completing the program. That could potentially increase retention numbers.

- Continue providing an exit interview to help improve the program. Surveys for companies that receive graduates and interns could also provide valuable information.

Advanced Manufacturing Program Review Visiting Team

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