Grant Title: **Accelerated Pathways in Advanced Manufacturing (APAM)**
Author: **Community College of Rhode Island**
Link: http://www.ccri.edu/

Document: Number10 Strategy3 Activity1 Deliverable14e - 04-ETMQ-Certificate-Manufacturing Automation Quality-rev.03

DOL Disclaimer Statement:

PROGRAM PROPOSAL APPROVAL TRACKING FORM

Name of Proposal: Certificate - Manufacturing Automation and Quality (ETMQ)

SIGNATURES REQUIRED PRIOR TO SUBMISSION

Academic Department

Proposal Originator(s): _____ _____
Signature **Date**

_____ _____
Signature **Date**

Department Vote for Approval: **# Yes** 10 **# No** ____ **# Not Voting** ____
(Department members voting "no" may submit a separate report)

Department Chair: _____ _____
Signature **Date**

Academic Dean: _____ _____
Signature **Date**

Note: ***All sections of this form must be completed and submitted with all required attachments to the Chair of the Curriculum Committee according to published distribution schedule. Should you have any questions, call the Office of the Dean of Business, Science and Technology, 825-2147.***

CURRICULUM REVIEW COMMITTEE MEETING FOLLOW UP

Meeting Date: _____ **Committee Vote:** **# Yes** ☐ **# No** ☐ **# Abstentions** ☐

Curriculum Committee Chair: _____ _____
Signature **Date**

☐ **Forward to VPAA and President** ☐ **Return to Department**

V.P. for Academic Affairs: _____ _____
Signature **Date**

President: _____ _____
Signature **Date**

☐ **To PEEC for Certificates of 18 or less** **Date of Approval:** _____

☐ **To ASAC / BOG** **Date of Approval:** _____

☐ **READY FOR IMPLEMENTATION**

File: Office of Vice President for Academic Affairs

Community College of Rhode Island

Program Proposal:

X	**New Program**
	Revised Program

Date Submitted: 3 / 14 / 16

DEPARTMENT: Engineering and Technology

DEVELOPED BY: Jerry Bernardini, Edward Hanrahan and Raymond Ankrom

PROGRAM TITLE: Manufacturing Automation and Quality: ETMQ

TOTAL PROGRAM CREDITS: 19

Will program require the creation of any new courses? **Yes** [x] **No** [ ]

If yes, list new courses:

ETCN 2250
ETCN 2350
ETCN 2360
ETCN 2400 (Industry and OSHA-10 Seminars

Will program replace another program of study? **Yes** [ ] **No** [x]

If yes, list course and program of study:

Will program be an Associate Degree Program?	[ ]	**If yes, specify degree type:**		[x] **No**
Will program be a Certificate Program?	[x]	**If yes, specify total credit hours:**		[ ] **No**

RATIONALE FOR THE PROGRAM:

Modern manufacturing has been revolutionized by the use of computer numerical control (CNC) machining. In modern CNC systems, end-to-end component design is highly automated using computer-aided design (CAD) and computer-aided manufacturing (CAM) programs. For manufacturers to be competitive they need workers skilled in CNC operations and program design. Growing in use is 3D-design and 3D-printing to support rapid prototyping of designs. Many employment opportunities will be available to students that have all the skills and knowledge associated with CNC and rapid prototyping technology. The program has been designed to provide the student with extensive hands-on laboratory experience, utilizing a recently renovated laboratory. This experience will maximize the skills advocated by a manufacturing advisory board (See attachment). The certificated is the first of a two-certificate sequence for developing CNC related skills and knowledge.

CATALOG DESCRIPTION:

Description Overview

This certificate will allow students to measure the quality of manufactured products and develop efficient manufacturing processes. Students will gain experience with a variety of advance manufacturing technologies, including wire EDM, plasma cutting 3D printing and laser cutting. The student will receive an OSHA-10 certification and the opportunity to attend four industry presentations. The certificate can be completed one year part-time and a summer session and semester full time. All credits can be applied to the Manufacturing Technology A.S. degree. 19 credits

Program Courses , Hours and Scheduling

Certificate –Manufacturing Automation and Quality

MANUFACTURING AUTOMATION AND QUALITY - ETMQ		Prerequisite
Precision Measurement & Geometric Dim. Tol.	ETCN 1200	-
Introduction to Digital systems (PLCs)	ETEE 1800	-
**Automated Machining Technology	ETCN 2350	ETME 1020
Introduction to Robotics and Control	ETME 1010	
Automation Systems	ETME 2310	ETME 1010
**Manufacturing Quality Control	ETCN 2360	
** Lean Manufacturing	ETCN 2250	
**Industry and OSHA-10 Seminars	ETCN 2400	-

Learning Outcomes

1. Students will be able to setup and operate wire EDM, plasma and laser cutting machines
2. Students will be able to program PLC's
3. Students will be develop the knowledge of basic robot systems and their programming
4. Students will learn the basic s of modern automated manufacturing
5. Students will be able apply LEAN principles to manufacturing
6. Student will be able to apply quality control principles to manufacturing
7. Students will be able to perform precision measurement of manufactured units
8. Student will receive an OSHA-10 certification
9. Students will learn from industry representatives real-life manufacturing issues

MANUFACTURING AUTOMATION AND QUALITY - ETMQ					Degree Required
Precision Measurement & Geometric Dim. Tol.	ETCN 1200	3	2	2	3
Introduction to Digital systems (PLCs)	ETEE 1800	3	2	2	3
**Automated Machining Technology	ETCN 2350	3	2	2	
Introduction to Robotics and Control	ETME 1010	3	2	2	3
Automation Systems	ETME 2310	3	2	2	
**Manufacturing Quality Control	ETCN 2360	2	2	2	
** Lean Manufacturing	ETCN 2250	1	1	2	1
**Industry and OSHA-10 Seminars	ETCN 2400	1	1	4	
Certificate Totals		19	14	18	
Certificate Contact Hour Totals (15-week semesters)			210	270	

CNC Advisory Board

Paul Cary; Quick Fitting

Thomas Hutchinson, Davol

Scot Jones, Groov-Pin

Tony Maneca, ArtVac

Dona Vincent, TEDCO

David Chenevert, Swissline

John Lombari, RI Carbide

Karen Paoluchi, Yushin America +1

Antony Picone, Mahr Federal

Michelle Desauliniers, Taco

Peter McLaughlin, Rice Mfg.

Tom Kowalczyk, KMRM, LLC

Greg Silva, Parkinson Tech.

Andrew Cortez, Building Futures

William McCourt. RIMA

Larry Lefebvre, Chemart

Curriculum Map

	ADVANCED MANUFACTURING TECHNOLOGY (ETMA) "I" = Introduces the concept "R" = Reinforces or contributes additional information "E" = Emphasis (assumes level of mastery)	ETMA Courses							
		Intr. to Robotics and control	Introduction to Digital systems	Precision Measurement and Geometric Tolerancing	Automation Systems	Lean Manufacturing	Automated Machining Technology	Manufacturing Quality Control	OSHA-10 and Industry Seminars
	Program Student Learning Outcomes **Students will be able to:**	ETME 1010	ETEE 1800	ETCN 1200	ETME 2310	ETCN 2250	ETCN 2350	ETCN 2360	ETCN 2400
	General Education, Core and Electives								
1	Analyze technical problems, propose solutions and document with written and oral reports	I	I	R	E	R	R	E	R
2	Employ technology for communications, data collection, analysis, simulation and control.	I	I	R	R	R	R	E	R
3	Use basic project management skills, project team work and ethical behavior	I	I		R	E	E	E	E
4	Use, analyze and troubleshoot basics of electrical and mechanical system components	I	R		R	R	E	R	
5	Use the basic manufacturing methods, measurements, automation and quality control	I	I	R	R	E	R	E	I
6	Code PLCs and micro controllers for networking and system control applications	R	I	I	R	R	E	E	
7	Apply engineering design and project management LEAN principles	R	I	R	R	E	E	E	R
8	Read blue prints, perform component measurements and utilize the Machinery's Handbook	R		I	R	R	R	E	R
9	Perform precision measurements on manufactured components			I	R	R	E	E	

Did an Advisory Committee assist in the development of this program?	**Yes**	X	**No**	
If yes, please attach a list of the names and affiliations of committee members.				

Are any arrangements with external organizations essential to offering this program?	**Yes**		**No**	X
If yes, please include a list of the names and affiliations of committee members:				

TRANSFERABILITY: **Is this program intended for transfer to the following institutions:**

☐ RIC ☐ URI ☒ Other, please specify _____

How does the program align with existing transfer agreements? For <u>each</u> course in the program, please list how the CCRI course aligns with sister institution. For example:

CCRI Course Title and Number -- RIC/URI Course Title and Number

ADMINISTRATIVE PLANNING

Please comment on the effects and requirements of the proposal in relationship to the following:

PHYSICAL: On which campuses will the program be offered?

Knight __x__ **Flanagan** ____ **Liston** ____ **Newport** ____

Days ____ **Evenings** __x__ **TV** ____ **Internet** ____ **Satellites** ____ **Specify:** _____

Requested start date: __8__ / __31__ / __2016__

FINANCIAL: Will this program necessitate any budgetary modifications? Please provide a brief summary under each budget as is appropriate:

Operating

Equipment

The cost of all necessary supplies estimated at $5000

Faculty

Edward Hanrahan
Ray Ankrom
Vern Mace
Jody Robinson

Staff

A 20 % of a fulltime technician will be required for equipment maintenance

OTHER DEPARTMENTS/AREAS

What other departments will be affected? How? Have they been contacted?

This program will not affect other departments.