

Grant Title: **Accelerated Pathways in Advanced Manufacturing (APAM)**

Author: **Community College of Rhode Island**

Link: <http://www.ccri.edu/>

**Document: Number10 Strategy3 Activity1 Deliverable14c - 02-ETMD-Certificate-Manufacturing Design Rapid Prototyping-rev.04**

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# PROGRAM PROPOSAL APPROVAL TRACKING FORM

Name of Proposal: Certificate – Manufacturing Design & Rapid Prototyping (ETMD)

## SIGNATURES REQUIRED PRIOR TO SUBMISSION

<b>Academic Department</b>		
Proposal Originator(s):	<div style="border-bottom: 1px solid black; text-align: center;">Signature</div>	<div style="border-bottom: 1px solid black; text-align: center;">Date</div>
	<div style="border-bottom: 1px solid black; text-align: center;">Signature</div>	<div style="border-bottom: 1px solid black; text-align: center;">Date</div>
Department Vote for Approval:                      # Yes <u>10</u> # No <u>      </u> # Not Voting <u>      </u> <i>(Department members voting "no" may submit a separate report)</i>		
Department Chair:	<div style="border-bottom: 1px solid black; text-align: center;">Signature</div>	<div style="border-bottom: 1px solid black; text-align: center;">Date</div>
Academic Dean:	<div style="border-bottom: 1px solid black; text-align: center;">Signature</div>	<div style="border-bottom: 1px solid black; text-align: center;">Date</div>

**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.

<b>CURRICULUM REVIEW COMMITTEE MEETING FOLLOW UP</b>		
Meeting Date: _____	Committee Vote:    # Yes <input style="width: 30px;" type="checkbox"/>	# No <input style="width: 30px;" type="checkbox"/> # Abstentions <input style="width: 30px;" type="checkbox"/>
Curriculum Committee Chair:	<div style="border-bottom: 1px solid black; text-align: center;">Signature</div>	<div style="border-bottom: 1px solid black; text-align: center;">Date</div>
<input style="width: 30px; height: 20px;" type="checkbox"/> Forward to VPAA and President	<input style="width: 30px; height: 20px;" type="checkbox"/> Return to Department	
V.P. for Academic Affairs:	<div style="border-bottom: 1px solid black; text-align: center;">Signature</div>	<div style="border-bottom: 1px solid black; text-align: center;">Date</div>
President:	<div style="border-bottom: 1px solid black; text-align: center;">Signature</div>	<div style="border-bottom: 1px solid black; text-align: center;">Date</div>
<input style="width: 30px; height: 20px;" type="checkbox"/> To PEEC for Certificates of 18 or less	Date of Approval: _____	
<input style="width: 30px; height: 20px;" type="checkbox"/> To ASAC / BOG	Date of Approval: _____	
<input style="width: 30px; height: 20px;" type="checkbox"/> READY FOR IMPLEMENTATION		

File: Office of Vice President for Academic Affairs

# Community College of Rhode Island

## Program Proposal:

☒

New Program

☐

Revised Program

Date Submitted: 03 / 10 / 16

DEPARTMENT: Engineering and Technology

DEVELOPED BY: Jerry Bernardini, Edward Hanrahan

PROGRAM TITLE: Manufacturing Design & Rapid Prototyping

TOTAL PROGRAM CREDITS: 20

Will program require the creation of any new courses?

Yes ☒

No ☐

If yes, list new courses:

ETCN 1000: Mechanical Industrial Design

Will program replace another program of study?

Yes ☐

No ☒

If yes, list course and program of study:

Will program be an Associate Degree Program?

☐

If yes, specify degree type:

☒ No

Will program be a Certificate Program?

☒

If yes, specify total credit hours:

☐ No

### RATIONALE FOR THE PROGRAM:

Modern advanced manufacturing has been revolutionized by the use of computers for design, machining and automation. Today the design of almost all products and components is accomplished with the use computer-aided design (CAD) and computer-aided manufacturing (CAM) programs. The manufacturing process utilizes computer to control all aspects of subtractive and additive manufacturing (3D printing). Computer numerical control (CNC) machining is at the heart of advanced manufacturing and the production of complex components accurately and efficiently. Advanced manufacturing also uses computers to control the supply of materials, the inspection and distribution of finished products.

DESIGN & RAPID PROTOTYPING -ETMD		Prerequisite
Engineering Graphics (Solidworks)	ENGR 1030	-
Blue Print Reading and Machine Handbook	ETCN 1100	-
Intro to Manufacturing Process	ETME 1020	-
Introduction to AutoCAD	ENGT 1060	-
*Advanced Solid Modeling	ENGT 2090	ENGR 1030
** Mechanical Industrial Design	ETCN 1000	ENGR 1030, ETME 1020
3D Modeling and Prototyping	ETCN 2300	ENGT 2090

**CATALOG DESCRIPTION:****Certificate –Design & Rapid Prototyping****Description Overview**

This certificate will allow students to develop the knowledge and skills for preparing the files and drawings for a variety of mechanical devices and components. The student will develop skills with contemporary CAD software to produce files suitable for machining and 3D printing. The emphasis will be place on designing for advanced manufacturing technology, rapid prototyping using 3D printers and mechanical simulation. 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

**Manufacturing Design & Rapid Prototyping  
(PROPOSED) rev.4**

<b>DESIGN &amp; RAPID PROTOTYPING -ETMD</b>					Degree Required
Engineering Graphics (SolidWorks)	ENGR 1030	3	1	4	3
Blue Print Reading and Machine Handbook	ETCN 1100	3	2	2	3
Intro to Manufacturing Process	ETME 1020	3	1	4	3
Introduction to AutoCAD	ENGT 1060	2	1	3	
*Advanced Solid Modeling	ENGT 2090	2	1	3	3
** Mechanical Industrial Design	ETCN 1000	3	2	2	
3D Modeling and Prototyping	ETCN 2300	3	2	2	
Certificate Totals		19	10	20	
Certificate Contact Hour Totals (15-week semesters)			150	300	

## **CNC Advisory Board**

Paul Cary; Quick Fitting

Thomas Hutchinson, Davol

Scot Jones, Groov-Pin

Tony Maneca, ArtVac

Dona Vincent, TEDCO

David Chenevert, Swissline

John Lombardi, RI Carbide

Karen Paoluchi, Yushin America +1

Antony Picone, Mahr Federal

Michelle Desaulniers, 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

		ETMD Courses						
<b>ADVANCED MANUFACTURING DESIGN &amp; RAPID PROTOTYPING (ETMD)</b> "I" = Introduces the concept "R" = Reinforces or contributes additional information "E" = Emphasis (assumes level of mastery)		Engineering Graphics	Intro to Manufacturing Process	Industrial Design	Advanced Solid Modeling	Blue Print Reading and Machinery's Handbook	3D Modeling and Prototyping	Introduction to AutoCAD
<b>Program Student Learning Outcomes</b> <b>Students will be able to:</b>		ENGR 1030	ETME 1020	ETCN 1000	ENGT 2090	ETCN 1100	ETCN 2300	ENGT 1060
General Education, Core and Electives								
1	Analyze technical problems, propose solutions and document with written and oral reports	I	E	I	R	R	R	I
2	Model three dimensional products and components using SolidWorks and AutoCAD (CAD software)	I	R	R	E	I	E	R
3	Use the basic manufacturing methods for the design and documentation of components	I	I	R	R	I	E	I
4	Use the Machinery's Handbook as source of manufacturing information	I	R	R	E	I	E	I
5	Read and apply blue print information for manufacturing	I	R	I	E	I	R	R
6	Apply the basics of engineering materials, structures and to mechanical design	I	R	E	E	R	R	R
7	Apply the processes of subtractive and additive (3D-printing) manufacturing for rapid prototyping	I	R	R	R	R	E	I

Did an Advisory Committee assist in the development of this program?

Yes ☒

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 ☒

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 each 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**   X   **Newport**       

**Days** X    **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 material and supplies estimated to \$4000

## Faculty

Raymond Ankrom  
Edward Hanrahan  
Vern Mace  
Jody Robinson

## Staff

A 10% 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.