Cincinnati State Technical and Connnunity College
Manufacturing Engineering Technology
Manufacturing Computer Numerical Control (CNC) Certificate
June 26, 2017

To: Regina Livers
Cincinnati State Technical and Connnunity College
3520 Central Parkway
Cincinnati, OH 45223

Enclosed is my review of the CNC Ce1iificate Program at Cincinnati State Technical and Community College.

This packet includes:

1. Curriculum Review Rubric (starts on page 2).
2. Course rubrics for MET 111 and MET 131 since these are Transfer Assurance Guide (TAG) approved courses (starts on page 9).
3. My credential as requested in the Cuniculum Review Rubric (starts on page 20).

Thank for the opportunity to review this program. I enjoyed working with you and the faculty and staff at Cincinnati State. Please let me know if you have questions, concerns, or need fmiher details about my rep01i. I am available by phone, email, or in-person to discuss it.

Thank you.

Robert E. Speckert, Professor Emeritus
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Cincinnati State Technical and Community College

Greater Cincinnati Manufacturing Career Accelerator (GCMCA)
Trade Adjustment Assistance Community College & Career Training (TAACCCT)

Manufacturing Engineering Technology
Manufacturing Computer Numerical Control (CNC) Certificate

Cuniculum Review Rubric

Program/Materials Reviewed: Manufacturing Computer Numerical Control (CNC) Certificate; courses, labs, and meetings with faculty and adminish·ation.

College: Cincinnati State technical and Conununity College

Reviewed by: Robert E. Speckert, Professor Emeritus, Miami University

Date: June 26, 2017

See attached credentials ofreviewer, Robert E. Speckert, Professor Emeritus

Review Scale definitions:
Exceptional: Review component is excellent, represents a "promising practice", and is a model for replication.

Very good: Review component is complete and can be replicated.

Good: Review component is adequate but represents opp01iunities for improvement

Ineffective: Review component is weak and in need of significant improvement.

No or insufficient evidence: Review component was missing info1mation and not able to be assessed.

Program Overview	Excellent	Very Good	Good	Ineffective	No or Insufficient Evidence
I. Program Outcomes Clearly Stated and Measurable		X			
2. Course objectives support one or more programs		X			

3. Program Outcomes aligned to occupational focus (industry skills and standards) and prepare students for appropriate industry certification/s.	X				
4. Effective program structure (prerequisites, course sequence, stackable credential-structure provides a clear logical path to completion)	X				
Curriculum Overview and Syllabi					
1. Course objectives support one or more programs or program outcomes.		X			
2. Unit/Module Outcomes are clearly stated and measurable.		X			
3. Unit/Module Outcomes support one or more course outcomes.		X			
4. Syllabus includes the following information: a. Course title and Number b. Credit hours c. Pre-requisites d. Course description e. Plagiarism policy f. ADA Statement/Policy g. Student Resources h. Institutional Policies/Procedures i. Technical Support j. Grading Policy stated clearly and how grades are calculated k. Criteria by which student work will		X			

be evaluated (Rubric)					

Comments or Recommendations Specific to Program Overview

1. It is recommended that the program outcomes be listed in the promotional materials for the program. The Program Description provides some outcomes. I suggest a separate "outcomes" section with a more complete list of outcomes.
2. Course objectives support one or more programs but are too general as written. Courses MET 111, 112, and 113 need specific outcomes related to manufacturing and CNC.
3. Program outcomes are closely aligned with career field and industry needs.
4. Program structure is well done and logical. Course flow makes sense and enables students to build their skills. The credits earned in the certificate program can be applied to an associate degree program.

Comments or Recommendations Specific to Curriculum Overview and Syllabi

1. Course objectives are logical and supp01i other programs.
2. Course objectives me clearly stated and logically build in content and level.
3. Courses MET 111, 112, and 113 need specific outcomes related to manufacturing and CNC.
4. The MET course syllabi contain all necessary information. I suggest adding the College name and Division name at the top of each syllabus. The Math syllabi do **not** have an ADA statement.

General Comments or Recommendations:

The overall program structure is very good. I suggest developing program level outcomes and publishing these; adding technically specific outcomes to MET 111, 112, and 113; and adding ADA statements to math syllabi.

Instructional Materials and Lab Resources	Excellent	Vely Good	Good	Ineffective	No or Insufficient Evidence
1. Align with stated course or unit learning objectives.	X				
2. Meet/reflect current industry practices and standards.	X				
3. Provide options for multiple learning styles.	X				
4. Instructional materials are cited properly.	X				
5. There is evidence of materials and resources that support innovative lem-ning techniques.	X				

Comments or Recommendations Specific to each section rated:

1. Instruction materials and lab activities are excellent. I took a tour of the labs and observed the students at work. The equipment, software, and learning materials were excellent.
2. The lab equipment was primarily based on Haas controls and machines. Students were receiving hands-on laboratory experience in CNC operation, set-up, programming, and manufacturing of various parts using turning and milling processes. Off-line programming units made it possible for each student to practice on their own and, using simulation, test run the programs they had written.
3. Students were exposed to lectures, labs, demonstrations, hands-on activities, and simulations. Students were able to work independently and under the tutelage of the instructor. I observed teacher helping students, students helping students, and students working independently. The activity on the lab was exciting and engaging.
4. The instructors were making effective use of a variety of instructional materials. I saw instructor notes from lectures, programming guides from the manufacturer, self-paced cun-iculum materials, and step by step explanation of machine set-up, programming, and operation.
5. The various machines, simulators, in-lab discussions, and student to student tutoring, and teacher led discussions provided students a variety of ways to learn and reinforce learning of material.

General Comments or Recommendations:
The labs suppmting this certificate program are excellent. There is a strong focus on safety, proper equipment utilization, care for and clean-up of equipment and facilities, and effective alignment with industry needs.

Overview Table: Objectives. Modules/ Units, Learning Activities and Assessments	Excellent	Very Good	Good	Ineffective	Noor Insufficient Evidence
1. Modules/units are aligned to course objectives		X			
2. Learning activities align with stated module/unit objectives		X			
3. Leaming activities provide oppo1tunities for interaction and active learning	X				
4. Learning activities provide options for multiple learning styles.	X				
5. Learning activities are linked to current industry practices,		X			

standards and ce1tifications					
6. Learning activities demonstrate evidence of innovation or enhancements to suppmt adult learner success.		X			
7. Materials/resources (including equipment, tools and software) are used in a way that students understand their purpose and use in industly settings.		X			
8. Assessments measure stated learning objectives and link to industry standards.			X		
9. Assessments align with course activities and instrnctional materials and resources.		X			
10. Assessments are sequenced throughout the instructional period to enable students to build on feedback.		X			
11. Assessments are varied and appropriate to content.		X			
12. Assessments provide oppo1tunities for students to measure their own learning progress.		X			

Comments or recommendations specific to each section rated:

1. There appears to be effective alignment of course content and stated program expectations. The program needs specific learning outcomes. I suggest mapping how the course content/outcomes align with the program outcomes in a DACUM chmt. I also suggest rnbrics be developed for program outcomes so this program can be duplicated at other colleges.
2. The materials listed in the course syllabi are effective and consistent with industry needs. Lab activities are quite effective. I suggest publishing the activities and making them pmt of the program package to share with other colleges.

3. The walk-through of the lab showed me first-hand that active and engaged learning was taking place. This portion of the program is excellent.
4. Students have the opportunity to learn through lectures, labs, demonstrations, hands-on activities, and simulations. Students were able to work independently and under the direction of the instructor. While touring the labs students were working in small groups with the teacher, working in small groups on a simulator and discussing the results, and there were individual students running machines, working out of a textbook/lab manual, programming machines and simulators, measuring parts, and more. The lab was a center of learning and engagement.
5. The machine tools, software, and related equipment and supplies are typical of that found in industly. There was no evidence that the curriculum is focused on obtaining industly certifications. That said, the curriculum is well-aligned with industry needs in the area of manufacturing/CNC. Students who complete this ce1tificate program are getting jobs and adding value to industl-y.
6. I witnessed a variety of students in the labs of various ages. Adult learners were just as likely to be engaged and productive as recent high school graduates.
7. The instructor was making effective use of equipment, software, and simulators. Students had the necessary measuring tools, setup tools, and other supplies needed to be productive in the lab.
8. There is no mapping of program or course learning outcomes to industry standards. I do believe that an outcome chmt mapped to industry needs would be useful. Promotional materials do provide a list of skills completers should possess and jobs they should be able to obtain.
9. Assessments tend to be an effective balance of homework, labs, quizzes and tests. The course activities seem to suppo1t the assessments and enable students to demonstrate knowledge and understanding of the material in a variety of ways.
10. Assessments tend to be spaced through the course and seem to grow in complexity, depth, and breadth. In addition to technical content, students are also required to demonstrate growth in oral and written communication, problem analysis and synthesis, problem solving, team work, timeliness, quality, and continuous improvement.
11. Assessment is vm·ied and is a balanced mix of homework, lab activities, in class activities, quizzes, and tests. This is effective for meeting the needs of a variety of students with different learning styles.
12. The material shared with me shows assessment activities through the semester with grades (pints) assigned to each. Students have access to their course content through the course learning management system and they can track their own progress in real time.

General Comments or Recommendations:

- On the general Manufacturing CNC Ce1tificate curriculum guide, under Pre-Reqs., change MET 132 to MET 131

- On the program flier under Program Description, add a comma after aerospace.
- I suggest developing a set of program outcomes and show how the curriculum (courses) map to these outcomes. I also suggest developing rubrics for each program outcome using Blooms Taxonomy or Depths of Knowledge verbiage. It would also be effective to develop rubrics for the learning outcomes for each course. Since MET 111 and MET 131 are Transfer Assurance guide approved courses, I have provided te approved rubrics (guides) for these courses.

Rubrics for TAG approved courses

OET0 10 Manufacturing Processes
(Cincinnati State course number MET 111)

and

OET012 Computer Aided Drafting and Design
(Cincinnati State course number MET131)

The purpose of this guide is to provide a range of knowledge at which students can demonstrate proficiency for each objective. Subsequent college course success depends strongly on courses taught primarily at the "some applied skills demonstrated" and "applied skills strongly demonstrated" levels.

TAG Learning Outcomes	Applied skills strongly demonstrated	Some applied skills demonstrated	Little applied skills demonstrated	No applied skills demonstrated
1. Demonstrate an understanding of the interrelationships between material properties and manufacturing processes.*	• Develop a manufacturing plan based on the interrelationships between material properties and manufacturing processes needed to produce the part. • Decide the best manufacturing processes for various parts based on the material properties. • Explain why material selection is integral to design and manufacturing. • Discuss the impact of poor or improper material selection on	• Analyze and classify the interrelationships between material properties and manufacturing processes. • Differentiate the manufacturing process that is used on common material properties. • Discuss material selection and manufacturing process criteria. • Discuss impact of material selection on design, manufacturing, assembly. • Understand the effect of steel additives such as	• Explain and discuss the interrelationships between material properties and manufacturing processes. • Explain hardness related to tensile strength. • Identify basic dynamic properties (impact, fatigue, creep). • Define machinability, formability, and weld ability. • Understand chip formation and effect of material microstructures.	• Define the interrelationships between material properties and manufacturing processes. • Define characteristics of metallic and non-metallic materials. • Identify basic physical properties of materials (density, thermal, optical, electrical). • Identify basic mechanical properties of materials (stress, strain, tensile, elongation, yield strength, shear strength-material

	product reliability and product failure liability. • Heat treat specimens to determine material and carbon content and match to hardness achieved.	sulfur to machining properties.		removal), ductility, brittleness, toughness, hardness, and hardness scales (e.g., Brinell, Rockwell).

2. Distinguish between different manufacturing processes such as forgings, extrusions, castings, forming, and finishing.*	Construct and propose a plan to use the different manufacturing processes such as forgings, extrusions, castings, forming and finishing, completing parts in the most efficient manner. • Given a product, identify how that product is likely made, and validate or correct the answer using research. • Make patterns for sand casting and pour an aluminum part. • Understand gating and venting needs in a casting.	• Analyze and classify the between the different manufacturing processes such as forgings, extrusions, castings, forming and finishing. Construct a process for making many different parts using the various manufacturing processes. • Plan a manufacturing process to make certain products. • Know when a forging is best and the benefits of forging properties. • Understand when grinding and polishing are necessary and the material removal.	Explain and discuss the differences between different manufacturing processes such as forgings, extrusions, castings, forming and finishing. Identify, describe, show examples of products made using electro-chemical and electric discharge processes. • Explain how threads are made. • Identify types of threads and applications for each.	• Define the different manufacturing processes such as forging, extrusion, casting, forming and finishing. Identify, describe, and give examples of products made using material removal processes such as turning, milling, drilling, threading, and sawing. • Identify, describe, and give examples of products made using forming, extruding, and casting. • Identify, describe, and give examples of products made using finishing processes such as grinding, sanding, coatings, and annealing.

3. Distinguish between different fabrication processes such as welding, fasteners, and adhesives.*	• Construct and propose a plan to use the different fabrication processes such as welding, fasteners, and adhesives to produce parts in the most efficient manner. • Evaluate the strengths and weakness of each of the fabrication processes such as welding, fasteners, and adhesives when it comes to the production of parts. • Given a product, identify how that product is likely fabricated, and validate or correct the answer using research.	• Analyze and classify the different fabrication processes such as welding, fasteners, and adhesives. • Distinguish the different types of Fusion welding, Resistance welding, and brazing. • Construct a process for making many different parts using the various fabrication processes. • Plan a manufacturing fabrication process to make certain products. • Know what the UNC UNF bolt thread classes are and Metric. • Tap and Die to create threads.	• Explain and discuss the differences between different fabrication processes such as welding, fasteners, and adhesives.	• Define the different fabrication processes such as welding, fasteners, and adhesives. • Identify, describe, and show examples of types of fasteners. • Identify, describe, and show examples of type of adhesives. • Identify, describe, and show examples of types of welding processes.

4. Apply process parameters to optimize production efficiencies.*	• Construct and propose a plan to use the different empirical data to determine speeds and feeds to optimize production efficiencies. • Produce the Speed and Feed data from the charts based on the material and machining process and calculate the proper feed and speed based on that different machining process. D Evaluate the findings and determine if a different machining process would be required to optimize production efficiencies. • Create a CNC program using manual G code technique to cut a part. • Analyze and classify the empirical data to determine speeds and	• Produce the Speed and Feed data from the charts based on the material and machining process and calculate the proper feed and speed based on that different machining process. • Calculate N (RPM) using N=(12*V) /(rr*D); Use and validate that V=(N*rc*D)/12, and apply to real manufacturing examples. • Calculate forces (Fe-cutting force, Ff-feed force, and Frradial force) on a single point tool. • Show how these forces can be used to design fixtures, tool holders, and drive systems. • Calculate material removal rate (M RR).	• Explain and discuss the empirical data to determine speeds and feeds to optimize production efficiencies. • Discuss efficiency and energy losses. • Determine HP motor using efficiency and HP spindle. • Explain that material removal is causing material to fail in shear. • Recognize three feeds; feed in inches per minute, in inches per revolution, and in inches per tooth. • Using a given feed, determine the other two feed rates where appropriate. • Use feed rate to determine cut time. • Understand relationship of each feed to the process. • Look up and demonstrate understanding of specific	• Describe speeds and feed to optimize production efficiencies. • Understand that all manufacturing operations have limits (machine size, HP, tool size, finish, etc.). • Use machinability reference books to look up suggested speeds and feeds. • Identify values generally looked up in a reference book or required by the manufacturing operation (depth of cut, V, diameter of part or tool, and feed rate).

	feeds to optimize production efficiencies.	• Calculate HPspindle given HPs and MRR. • Know the effect of speeds and feeds on surface finish and material removal ranges.	(or unit) HPs given material.	

5. Demonstrate appropriate safety procedures and methods in a manufacturing setting.*	• Construct and propose safety procedures and methods in a manufacturing setting to insure the safety of the employees. • Develop appropriate safety procedures and methods in a manufacturing setting.	• Analyze and classify appropriate safety procedures and methods in a manufacturing setting. Determine what is safe and unsafe in the many different manufacturing settings. •	• Explain and discuss the appropriate safety procedures and methods in a manufacturing setting. Discuss OSHA and other safety enforcement agencies. • Discuss importance of safety to industry productivity.	Describe the appropriate safety procedures and methods in a manufacturing setting. Demonstrate an understanding of and need for Personal Protection Equipment. • Demonstrate understanding of and need for Lock Out Tag Out. • Demonstrate understanding of and need for fall protection.

6. Demonstrate proficiency in the use of measurement instruments.*	• Select the proper measurement instruments based on the instruments accuracy and precision. • Perform the proper steps to determine the correct measurement on various features. • Know the vernier scale. • Read micrometer to fabricate and know precision ..	• Compare the differences of use of the measurement instruments. • Produce the correct measurement on various features. • Calculate allowance/ interference and tolerance values for various classes of fit. • Solve and apply class of fit problems. • Read a vernier caliper to produce quality parts. • Know dimensional metrology and how to measure parts to within 1 thousandth accuracy.	• Explain the use of measurement instruments. • Demonstrate the proper use of each type of measurement instruments. • Discuss class of fit in design of mating parts. • Identify the difference between tolerance and allowance/interference. • Demonstrate understanding of how to measure parts given dimensions and specifications.	• Describe the use of different measurement instruments. • Identify and describe the need for tolerances. • Demonstrate understanding of tolerance. • Demonstrate proficiency in reading vernier, dial, and digital calipers and micrometers. • Demonstrate proficiency in reading linear scales and gages. • Describe relationship and importance of measured values to specifications.

The purpose of this guide is to provide a range of knowledge at which students can demonstrate proficiency for each objective. Subsequent college course success depends strongly on courses taught primarily at the "some applied skills demonstrated" and "applied skills strongly demonstrated" levels.

TAG Learning Outcomes	Applied skills strongly demonstrated	Some applied skills demonstrated	Little applied skills demonstrated	No applied skills demonstrated
1. Demonstrate proficiency of a commercial CAD system based on ASME (ANSI) Y14.5M or equivalent ISO standards.*	• Create and manipulate engineering drawings with little to no assistance. • Apply appropriate details and symbols on a drawing to improve part function and manufacturing. • Create engineering diagrams to solve engineering problems.	• Operate a CAD system to produce/edit engineering drawings on a CAD system. • Create appropriate details and symbols on a drawing, based on part function. • Produce engineering diagrams with appropriate symbols.	• Utilize a CAD system to reproduce/ edit engineering drawings. • Create appropriate details and symbols on a drawing. • Produce predetermined engineering diagrams and apply engineering symbols not given.	• Reproduce appropriate dimensions and symbols on a predetermined drawing. • Produce predetermined engineering diagrams.
2. Create working drawings using orthographic projections, section views, and auxiliary views.*	• Draw orthographic views from complex objects. • Create first and third angle projection drawings. • Assess best section view. • Select and apply graphical material annotations. • Determine auxiliary views necessary to completely detail drawings.	• Draw basic orthographic drawings. • Familiar with first and third angle projections. • Project section views. • Project auxiliary views.	• Interpret basic orthographic drawings. • Draw a predetermined section view. • Draw a predetermined auxiliary view.	• Identify orthographic views. • Identify a section view. • Identify section types. • Identify an auxiliary view.

3. Create detail drawings that include dimensions and tolerances.*	• Create multiple tolerance styles. • Set up multiple dimension styles in a CAD program. • Determine appropriate GD&T dimensions, tolerances, and symbols for a given part and manufacturing process.	• Implement appropriate dimensioning system or type; baseline, datum, and string. • Apply GD&T dimensions and tolerances on an engineering drawing.	• Add appropriate dimensions. • Demonstrate specific tolerance styles. • Reproduce symbols associated with GD&T practices.	• Recognize basic detailed dimensions and tolerance on drawings. • Recognize GD&T dimensions.
4. Create assembly drawings including bill oJ materials.*	• Determine/Produce all necessary drawings/ documents for a complete assembly drawing pack.	• Produce a complete assembly drawing pack based on predetermined parts.	• Reproduce assembly drawing packs.	• Identify necessary documents to include in an assembly drawing pack.
5. Demonstrate a basic knowledge of 3D modeling.*	• Develop 3D spatial visualization.	• Create objects using primitive solids and Boolean operations.	• Observe 3D capabilities of software demonstrated.	•*NIA*

Credentials for

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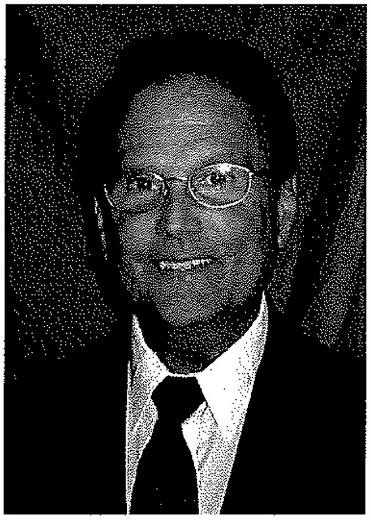

Robert E. Speckert

Professor Emeritus
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Education:

1975-1980 University of Cincinnati. Master of Business Administration Degree, Quantitative Analysis major.

1973-1975 Miami University, Oxford, OH. Bachelor of Science degree in Applied Science, Engineering Technology major.

1971-1973 Cincinnati Technical College. Associate of Applied Science degree, Engineering Technology major.

Certifications:

- Certified Manufacturing Engineer (Society of Manufacturing Engineers)
- Academic Jonah (Avraham Y. Goldratt Institute)

Additional Training: (some activities)

- Train the Trainer in Nano Technology, Penn State University, August 2009
- Nano Technology, Penn State University, May 2009
- Nano Technology, January 2009, Las Vegas (sponsored by NSF)
- Geomeu·ic Dimensioning and Tolerancing, March 2-3, 2008, Deu·oit, Michigan.
- **Lab View workshops, National Instruments, various dates.**
- **Lean Manufacturing, Fanuc Robots, Mason, OH February 2005**
- Academic Jonah Training on Themy of Constraints, Avraham Y. Goldratt Institute's program on Themy of Constraints/Continuous In1provement, Summer 1992
- Quality in Daily Work, Procter and Gamble's (P&G) Total Quality Management program, Spring 1992
- Team Member Training, Procter and Gamble's (P&G) Continuous Improvement program, Summer 1992
- Executive Decision Making, Avraham Y. Goldratt Institute's program on Theory of Constraints/Total Quality Management, Fall 1991

Experience:

Jan. 1985 -Present: Miami University, 1601 University Blvd., Hamilton, OH 45011
1985-1997: Associate Professor and Chair; 1997-2006: Professor and Chair; 2006-Present: Professor and Assistant Chair

June 1975 - Jan 1985: Cincinnati Technical College - 1.5 years as Division Coordinator of Cooperative Education and Public Relations. 8.0 years as Instructor/Program coordinator for Electro-Mechanical Engineering Technology and Computer Integrated Manufacturing **Technology. Spent 6 months at Cincinnati Milacron** in **customer training.**

Sept. 1974 - Sept. 1975: Kenner Products, Cincinnati, OH. Computer Operator. I operated a Bmrnugh's 3500 system processing a variety of business reports.

June 1973 - Sept. 1974: General Electric Company, Evendale, OH. Engineering Assistant.

Consulting and Seminars Presented: (pmtial list)
2009-present Consultant, Ohio Board of Regents, Transfer and Articulation
2006 Consultant, University of Cincinnati-College of Applied Science, Spring and Fall 2006. I worked **with the administration on assessment processes.**
2006-2007 Consultant for Tipco Punch, Inc, in Fairfield assisting them with quality control issues.
2004 Assessment Consultant, University of Cincinnati-College of Applied Science.
1995-2003-Developed and taught SPC and Continuous Quality Improvement for Feintool, Cincinnati and AK Steel.
1993 - Mitsubishi Electric (MELMAC) - Developed and in1plemented personnel evaluation system. Also developed training plan proposal.

Publications and Presentations: (selected works)

- "Developing an Assessment Plan to Meet TAC/ABET Criteria 1-8" at the Rose-Bulman Best Assessment Practices VII, February 26-28, 2006.

- **"Developing a Meaningful Assessment and Continuous Improvement Plan", Best Assessment** Processes VI, Rose Huhnan, Tene Haute, IN, March 2004. Also presented in April 2005 at Best **Assessment Processes VII** by **invitation.**

- "Alternative Delivery of a Baccalaureate Degree in Engineering Technology", October 24, 2000 - Co-Presenters: R Speckert, D. Hergert, and D. Bickerstaff

- **"TQM: The Topics, Tools and Techniques for Your Classroom". League for Innovation in** Community Colleges conference - November 1993 - Co authors: R. Speckert, P. Cantonwine and J. Streb.

- "Teaching Automated Manufacturing: Beyond Concept to Implementation" - Society of Manufacturing Engineer's Conference-November, 1992: Co-Authors J. Streb, P, Cantonwine and R. Speckert

- "Teaching Computer Integrated Manufacturing in the Interdisciplinary Classroom" - League for Innovation in Community Colleges conference- October 1991 - Co authors: J. Streb, P. Cantonwine and R. Speckert

- "LINK-UP/BCX" - Manufacturing simulation software for Lathes and Mills (1984-1993)

Service: (Recent activity)

2015-2016	Chaired, Search Connnittee, Mechanical Engineering Technology, James A. Meyers Endowed Professorship
2015-2016	Chaired, Search Committee, Electro-Mechanical Engineering Technology Associate **Professor position**
2015-present	Served, Advisory Council, Cincinnati Public Schools Career Tech
2014-present	Served, Advisory Council, Butler Tech-Adult Programs
2012	Served, Search Committee, Mechanical Engineering Technology Associate **Professor position**
2010-2015	Chaired, SEAS Evaluation of Adminish·ators Committee
2010-2015	Chaired, SEAS Grievance Appeals Board
2005	Chaired, Search Committee, Chair/Director of Nursing Depmtment, Miami University
2004-2006	Judge, B.E.S.T Robotics, University of Cincinnati-College of Applied Science.
2003-Present	Judge, Senior Design Projects, University of Cincinnati-College of Applied Science, Mechanical Engineering Technology.

2002-Present	Advisory Council, Greater Cincinnati TechPrep Consortium
2002-present	Served, Advisory Council, Cincinnati State Technical and Community College, Electro-Mechanical Engineering Technology
2002-present	Served, Advisory Council, Northwest School, Electro-Mechanical program
2000-present	Served, Advisory Council, Hamilton High School, Engineering Design program

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.