Re-visioning and Implementing a Precision Machining Manufacturing program

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wSu
TECH

Who is WSU Tech?

Kansas Two-year, Public Technical College

- Focus on Aviation, Aerospace Manufacturing, and Manufacturing at the National Center for Aviation Training
- 900+ Manufacturers in the region #4 in the US, #1 for Very High-Tech, #3 Engineering Hub
- Affiliated with Wichita State University in 2018
- 9,000+ students on 4 campuses and 40+concurrent high school partners
- Third largest two-year college in Kansas

Machining Technology

Machining Technology 2014-2023

- 300+ CNC/Machining shops in Wichita
- TAAACCT project-Round 2-National Aviation Consortium
- Featured Redesign of Machining program into 3 distinct tracks
  - CNC Operator (Certificate)
  - Manual Machining (Certificate)
    - Combined to make a large Certificate
  - CATIA-Design (AAS)
- Hosted Project MFG Finals; multiple National Medals at Skills USA

Machining Technology

THE ISSUE

- **Consistent Enrollment**
- **Matching the skills to industry need**
- **No pathway for additional CNC/Machining skills**
- **Growth of industry post-Covid**
- **Under-utilized equipment in the lab**

CNC Machining

Solutions and goals for program development

- Identified Machining curriculum, lab, and equipment redesign as primary focus

Why-Adjust program to focus on current industry trends; post-Covid

How-Create space to allow for new equipment to align with industry trends

- Shift program courses to create pathway for advanced CNC Machining skills
- Smart manufacturing and/or Industry training 4.0
- Allow for Applied Learning pathway parallel with program credentials
- Emphasis solely on CNC Machinist, no longer Machining and Design
- Focus on growing underrepresented populations

Overall Vision

- Update Curriculum that meets industry needs
  - Applied Learning: Expand relationships with Industry
- Modern Machines and full Automation
  - Alignment of 5 axis, materials, quality, and robotics
- Create opportunities for High School and Underrepresented Outreach
  - Scholarships, camps, expand faculty specialty
- Funding and partnerships to expand high school and post-secondary relationships.
  - Funding growth and recognition

Overall Vision-Solutions

- Internal: Update Curriculum that meets industry needs
  - Applied Learning: Expand relationships with Industry
- State Funded ARPA: Modern Machines and full Automation
  - Alignment of 5 axis, materials, quality, and robotics
- Gene Haas Foundation: Create opportunities for High School and Underrepresented Outreach
  - Scholarships, camps, expand faculty specialty
- IACMI ACE-net: Partnership to expand high school and post-secondary relationships.
  - Funding growth and recognition

Program Changes

- All Students will begin with CNC Operator program
- Eliminate Manual Machining TC
  - 2 courses-Machining I and II
  - Add Machining Fundamentals into CNC Operator TC
- Eliminate Design pathway for AAS
- Integrate ACE Training

<u>CNC Operator-23 Credit Hrs</u>

- Safety-Osha
- Print Reading
- Quality Control
- Metallurgy
- Machining Fundamentals
- CNC Operations-
- CNC Milling I (Probing)
- CNC Lathe
- Math Elective
- PDV 105
- CNC Controllers

Program Changes

Second Semester-Machining TC-37 hours

- Bench Work
- Precision Measuring
- Metrology
- CAM I
- Multi-Axis Machining
- General Education courses

Third Semester-Adv. Machining TC-52 hours

- Machine Tool Processes
- Geometric Dimensioning and Tolerancing for Machining
- CAM II
- Multi-Cell Operations
- Advanced Machining Processes
- General Education courses

New Machining Program

- Applied Learning-Schedule
  - CNC Operator-half days-morning, afternoon, and evening
  - 2nd/3rd Semesters-2 days a week
  - Hybrid schedule

3rd Semester focus on Advanced Equipment and Materials

- Work with NIAR and Industry partners on coursework in Multi-cell and Advanced Processes

Machining Lab Equipment

- 7 Haas VF2-3 Axis
- 2 Haas 750
- 6 Haas ST-15/20 CNC Lathes

- 10 Bridgeport Mill
- 10 Lathe

- Laser cutting
- Deburr Shaker
- Bandsaw
- Drill Press

6500 Square Feet

2 classrooms

Hexagon Romer Arm
Zeiss CMM
Starrett Optical Comparator

Use of ARPA to Automate

- 10 Brand new 5 Axis HAAS CNC Mills
  - Creation of Machining Cell with Automated Placement/Tending
- Tooling and Updates on existing machines
  - Tooling for harder material capability
  - Existing machines updated to match automation
- Inspection equipment to add to automation
  - Add to capability to focus on Metrology and Quality
- Robotics and Machine Tending
- Elements of Smart Factory

5 Axis option

Haas F1 Team
OFFICIAL MACHINE TOOL

MACHINES OPTIONS WHY HAAS SERVICE VIDEOS HAAS TOOLING HAAS SERVICE PARTS

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BUILD-&-PRICE DOWNLOAD AN INSTANT CUSTOM QUOTE FOR ANY HAAS MACHINE GET QUOTE

UMC-350HD

Save 5% on Your Entire Order! + Double Your Savings With Any Applicable Robot or Pallet Pool.

40	5	10k	18+1
TAPER	AXIS	RPM	TOOL CAPACITY

COMING SOON! AVAILABLE TO ORDER Q4 2022.

Additional Equipment

- Create specific Robotic and Automation cells
  - Parts Loader
  - Robotic Tender
  - Palatizing
  - AMR with Robotics program
- Machining Cell
  - Familiar with environment
  - Multiple usage
  - Allows for Single usage
- Metrology Focus
  - Additional CMMs
  - Inspection centers
  - Inclusion of software
  - Repair Romer
  - All new machines having probing
- Tooling and workspace
- Potential for additional machines-Working with WSU

Supporting Opportunities

- Gene Haas Foundation-Naming Rights $1,000,000 gift
  - Special Programs
  - IDE-A Initiatives
  - K-12 Outreach
  - Expansion of Programming
    - Credit
    - Non-Credit
- Gene Haas Innovation Lab

Supporting Opportunities

- IACMI
  - ACE Program
  - Funding to expand growth
  - Development of pipeline in Secondary
  - Create opportunities
  - National Exposure

Other Opportunities

- Build Back Better-EDA
  - Smart Factory
  - Creation of Manufacturing Cell with AMR
  - Smart Manufacturing using data and analytics
  - IOT in Machining
  - OEE
  - EDA Building-Quality/Inspection/Additive
- Urban Institute
  - Focus on Equity
    - Mentorship
    - Orientation
    - Data-driven
- Industry Partnerships in Apprenticeships and non-credit training

Questions/Comments

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