TRAC Machining Apprenticeship

TALENT READY
Apprenticeship Connection

UTAH SYSTEM OF HIGHER EDUCATION

uammi
UTAH ADVANCED MATERIALS + MANUFACTURING INITIATIVE

UMA | UTAH MANUFACTURERS ASSOCIATION

Introductions

Peter Reed – Talent Ready Utah, Program Manager

Martin Moore – UAMMI, Workforce Coordinator

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Education Partners

School Districts

Ogden

Weber

Davis

SLC

Granite

Alpine

Washington

Cache

Jordan

Tech Schools

Ogden-Weber Tech

Davis Tech

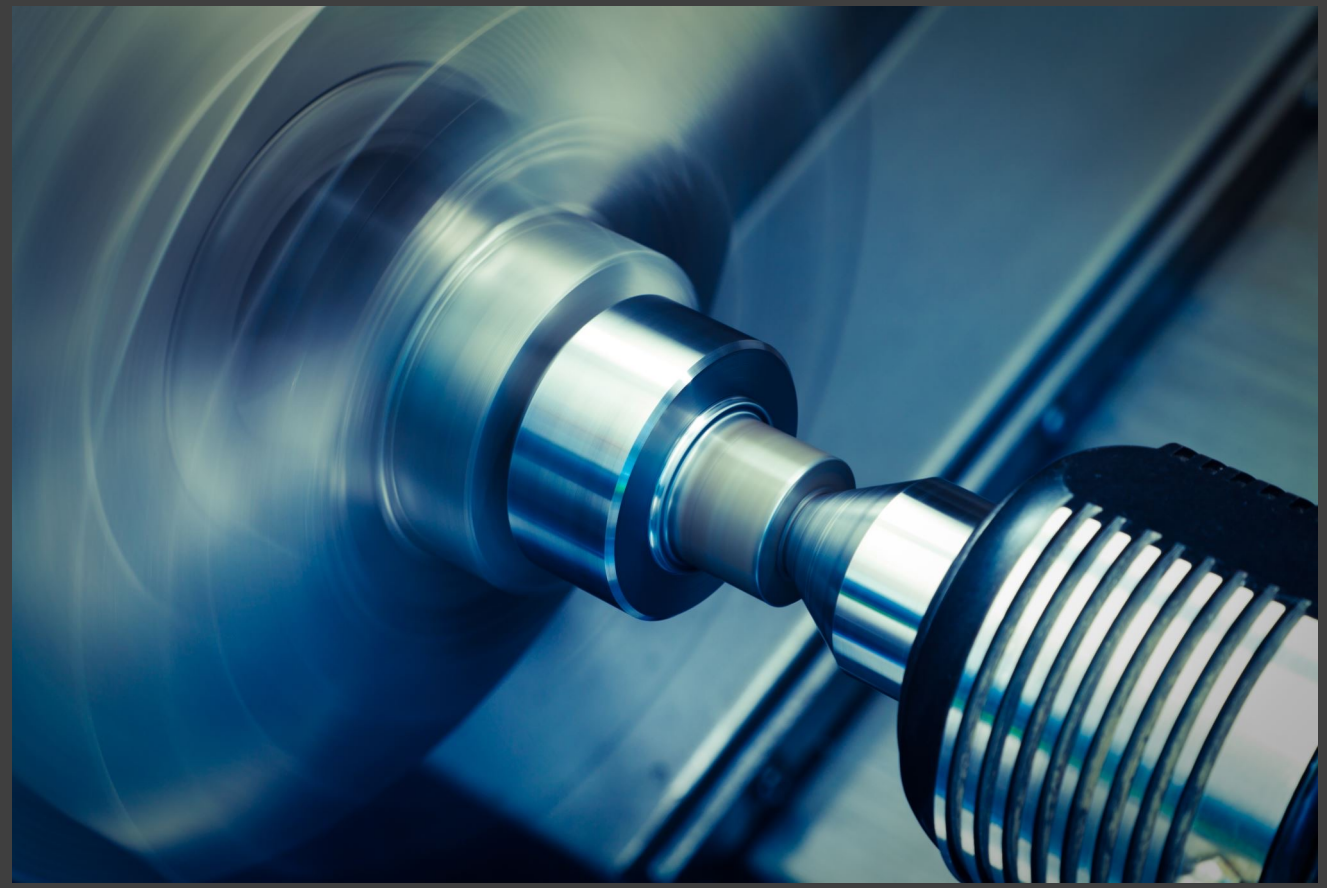
SLCC

Mountainland

Bridgerland

Dixie Tech

Industry Partners



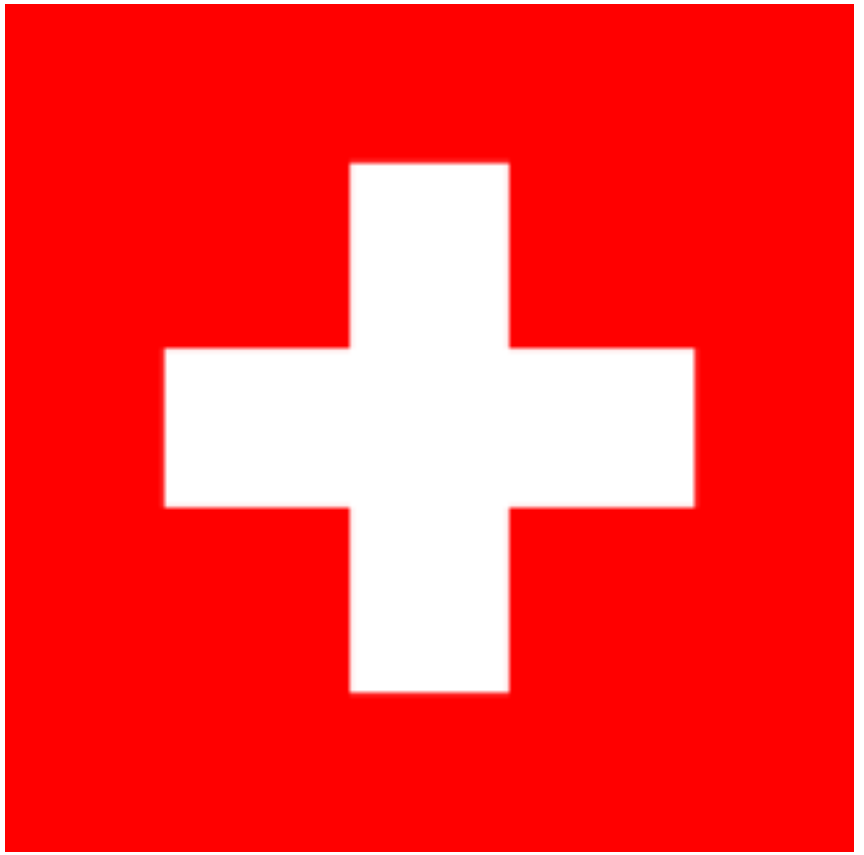
- JD Machine
- Parker Aerospace
- Leanwerks
- Skaydandee Machine
- Janicki Industries
- Advance Manufacturing
- Clean Machine
- Cyber Jet
- Paramount Machine
- US Synthetic
- Ram
- 3rd Gen Machine

Bridging Education and Industry

- Creating tomorrow's talent today
- The burden currently falls on our schools – but businesses are having difficulty finding employees with the appropriate competencies to fill skilled positions
- Talent acquisition is increasingly costly, challenging, and ineffective. Forward-thinking companies are growing their own talent pipelines through modern youth apprenticeships
- Apprenticeship is not a diversion from higher education – it's a rigorous education option that combines theoretical learning with practical learning that focuses career and education objectives
- It can be a direct path to high-paying in-demand jobs
- Stackable Credentials

The Swiss Model

- TRAC looks to the Swiss apprenticeship system for inspiration and borrowed elements to adapt. In Switzerland there are more than 230 apprenticeship occupations, and 40% of companies participate in the program. Many of the world's largest companies are run by CEOs that started off as apprentices.



TRAC
What is Unique?

- Concurrent enrollment
- Earn and learn model
- Begins in high school
- Mentorship
- Integrating classroom and workplace environments
- Pathways
- Stackable

What Does TRAC Mean to Higher Education?

- Worked-based learning
- Working with school districts
- Students are part-time employees
- Integration of existing curriculum with work experience
- Pathways and articulation agreements
- Curriculum collaboration
- Industry partner Collaboration/Ownership/Participation
- Capstone Project

TRAC – Value Add for Business

Reduce turnover costs and increase your employee retention rate

Recruit and develop a highly trained workforce for hard-to-fill positions

Create industry-driven and flexible training solutions to meet your business's needs

Positive ROI based on the value of apprentices' productivity

Apprentice Strategy

- Gradual – Train over 2-3 years to align with company standards and culture
- Capable – Loyal, adaptable, diverse, and digital-native talent pool
- Motivated – 88% of employers believe that apprenticeship leads to a more motivated and satisfied workplace
- Inexpensive – Approximately $10K per year during apprenticeship; $35K - $45K if hired

Outline

Learning Outcomes:

- Perform Machine Start-Up
- Monitor Processes
- Recognize Problems of Defects
- Describe Symptoms to Program Troubleshooter

Remember

Understand

Apply

Curriculum – Year 1

Machining safety/workplace practices:

- Orientation to Industry/Profession
- Safe Machining/Machine safety features
- PPE
- SDS sheets
- Following Standard operating procedures
- Organizing a work area
- Efficient machine operating
- Effective communication

Shop tool and machine maintenance:

- Use of hand tools (basic hand tools, vises, chucks, torque wrenches, ETC…)
- Maintaining Hand tools, vises, chucks, ETC…
- Machine Maintenance (Machine Fluids, oils, greasing a chuck, ETC...)
- Acceptable cutting coolant Concentration and PH levels
- Procedure for powering up a machine, zero return, and powering a machine down
- Understanding of machine movements and axes
- Basic tool sharpening and grinding

Shop Math:

- Fractions
- Decimals and Machining terms
- Unit Conversions
- Right Angles, Trig, and Proper application practices
- Offset Addition and Subtraction
- Speed and Feed Calculations

Machine Tooling:

- Lathe Tools Nomenclature
- Lathe Tool Application
- Milling Tools Nomenclature
- Milling Tool Application
- Tooling inserts
- Tool Wear/Tool Failure

Curriculum – Year 2

- Metrology:
  - How and when to use Calipers, Micrometers, Indicators, Comparators, and height gauges
  - How and when to use Bore gauges, Mueller gauges, ETC…
  - How and when to use gauge pins, plug gauges, thread gauges, and ring gauges
  - Qualification of Inspection Equipment
  - Visual inspections
  - Surface finishes
  - Part inspection:
  - How to Read a Blueprint
  - Basic GD&T
  - Part Tolerancing
  - First Article Inspections
  - Recording Inspections
  - In process inspections
- Understanding a CNC program:
  - CNC controller layout and use
  - Loading programs into a CNC Controller
  - Coordinate Systems, WPC's, and Work offsets
  - Understanding of Absolute and relative coordinates
  - Program Values and Depths
  - Basics of G&M Code
  - Sub programs
  - Tool offsets (ID and OD)
  - Machine Set-Up:
  - Loading lathe tools
  - Lathe tool touch off
  - Building up milling tools
  - Loading milling tools and touch off
  - Loading chuck jaws, vise jaws, and collets
  - Cutting chuck jaws, vise jaws, and collets
  - Setting "part zero" or a "work offset"
  - Proving out a program/set-up

Program begins junior year