TITANS of CNC ACADEMY

A REVOLUTION IN CNC EDUCATION

IMPLEMENTATION GUIDE
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**DEVELOPED BY A TITAN OF THE INDUSTRY**

World-class CNC Education for a new generation of Machinists, developed by Team TITAN.  
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## How It Works

Students learn the fundamentals of CNC through our project-based curriculum.  

## Why It Works

Students learn the entire process and advance their learning through repetition and stacking techniques.  

## West Coast Training Facility

A revolution in training for CNC Educators.  

## Titans of CNC: Curriculum

Our modular system builds confidence early and ramps up for fast retention through repetition.  

## Computer Aided Design (CAD)

From basic to advanced CAD models, we take the guesswork out of the equation.  

## Computer Aided Machining (CAM)

We deliver a thorough understanding of CAM that teaches anyone to program their own parts.  

## Computer Numerical Controlled (CNC) Machining

Project-based learning modules will have students machining real parts.  

## Requirements & Recommendations

What you need to teach the Titans of CNC: Academy Curriculum and other recommendations.  

## Titans of CNC: Case Study

The Titans of CNC: Academy Curriculum in action at Rocklin High School.  

## The Revolution

Join the largest Community of Makers that are changing the Industry.
TITAN GILROY is CEO of TITANS of CNC, an advanced training facility based in Rocklin, CA and a revolutionary online CNC Academy. TITAN’s clients have included aerospace companies SpaceX and Blue Origin, as well as other specialized industries. He also produced and starred in the reality series TITANS of CNC (Monday nights on MAVTV).

TITAN’s story is one of extraordinary circumstances. He has lived a life of homelessness on the beaches of Maui, spent time behind bars, and fought for the chance to build his own CNC machine shop. TITAN shared his story of hope and perseverance with a National Television Audience. Then, in the third season of the show, his life took another incredible turn. TITAN went into San Quentin Prison, built an Elite CNC Academy, and flipped rehabilitation on its head. It was because of this experience that TITAN developed the FREE TITANS of CNC: Academy Curriculum, which has wide implementation in diverse training applications. Educational Institutions, Prison Rehabilitation, Workforce Development, Company Training, Trade Schools, Private User Groups, Personal Learning, and many more have advanced their programs because of the TITANS of CNC: Academy.

Today, TITAN is not only an expert in CNC Machining but he has become the world’s leading advocate for the future of Manufacturing Education.

Titan Gilroy
CEO, TITANS of CNC
HOW IT WORKS

HANDS-ON EXPERIENCE
The FREE TITANS of CNC: Academy Curriculum covers the fundamentals of CNC Machining, Fixturing, Live Tooling, and advanced 5-Axis Machining. Every part in the Academy Curriculum utilizes a project-based approach to build the learners skills and understanding through repetition and the stacking of techniques. Each video tutorial walks students step-by-step through the entire process to achieve success and comprehension.

VIDEO-BASED LEARNING SERIES
Each Academy part features 3 video tutorials, known as the “TITAN Trilogy”. This “Easy as 1-2-3” approach teaches students what they need to know and results in a complete understanding of the process in producing a part from concept to reality. Titan often asks: “Why teach someone to tear apart a car, when all they need to know is how to change the oil?” We teach students what they need to know to complete each project.

STANDARDIZED MATERIAL
Each unique Academy Part is designed to fit within a standardized work envelope. This reduces costs, maximizes efficiency, and allows learning through repetition. Each student can effectively create part after part, achieving the comprehension that is needed to solve industry problems and achieve success.

STANDARDIZED TOOLING
The standardized Academy Tool Kits contain advanced carbide tooling by Kennametal, featuring 16 tools for multi-axis mills and 13 tools for turning lathes. This reduces costs for education programs by tens of thousands of dollars and allows students to become comfortable and confident with each fundamental tool. The Tool Kits can be expanded and upgraded as educators and students progress through each series.
**Developed by CNC Experts**

There is one simple reason the largest companies in the industry back the TITANS of CNC: Academy. TITAN and his Team are Experts in CNC Machining. Our proven experience in the Aerospace Industry allowed us to create a Curriculum unlike any other in the World. Our unique approach to CNC Education will teach your students to machine real-world parts 95% faster than any other program. In 6 weeks or less, a student with no prior machining experience will hold their first part in their hands.

**Modern Technology and Techniques**

Education has changed. The way educators and students assimilate information in their lives has shifted in the 21st Century. We speak to students the way they learn: through video tutorials and social media. The TITANS of CNC: Academy challenges and outperforms the traditional industry model at every turn.

**Project-Based Learning, Learn Anywhere**

TITANS of CNC: Academy is a project-based education platform that guides Educators and Students through the entire manufacturing process—from Art to Part. Learn how to design, program, and complete parts that meet print specifications in the classroom or from home. This modernized approach to online and hands-on CNC education gives users a head-start in their careers and prepares them to make parts that matter in real CNC production environments.

**TITANS of CNC: Academy Solves the Skills Gap**

Our founder, TITAN GILROY, visited many companies, trade schools, and manufacturing experts during the production of TITANS of CNC—the only national TV series to pull back the curtains on the manufacturing industry. One thing became clear to him at the close of the series' third season: there is a desperate need for modernized CNC curriculum to help train the 3.4+ million workers needed in the next decade. TITAN’s expertise in Aerospace machining afforded him the insight to create a curriculum that has changed the face of CNC Education forever.

**Why It Works**

- **Access Thousands of 3D Models**
- **Learn CNC Machining from the Experts**
- **Be Inspired to Do Amazing Work**
- **Make Real World Parts That Matter**
ADVANCED PRODUCTION FACILITY
TITANS of CNC is an advanced production and education facility based in Northern California. We feature the latest and greatest technology from Top Tooling, Machine Tool, and Software Companies. Kennametal, Haas Automation, DMG MORI, Autodesk, Blaser Swisslube, and more support the Academy with advanced hardware, software, and product engineers. This tremendous backing and support from our Industry Partners validates the relevance of the TITANS of CNC: Academy and its Curriculum!

HIGH-TECH CLASSROOM
Educators, Shop Owners, and Leaders of Industry will take their teaching ability to the highest level in our state-of-the-art classroom and production facility. Learners quickly progress beyond theoretical models and simulations to practical machining applications. Our unique facility allows educators to rapidly advance their CAD, CAM, and CNC knowledge in one location.

LEARN FROM THE EXPERTS
Our in-house Team of Experts, Top Industry Engineers, and Educators from around the globe will teach you all you need to know to implement the Academy Curriculum in your Institution. Our team will help you reenter your classroom with the confidence needed to break through barriers, help solve problems, and build the Next Generation of Machinists!

BECOME TITANS OF CNC: ACADEMY CERTIFIED
Educators who train at the West Coast Training Facility have the option to become TITAN Certified. This thereby grants Educators the authority to certify students who complete Academy Projects in their classrooms. TITAN Certifications have the backing of the Industry which validates the student’s learning and advances their opportunities in a manufacturing career.
TITANS OF CNC: CURRICULUM

MILL 101
- TITAN | BUILDING BLOCKS

MILL 201
- TITAN | THE ART OF FIXTURING

LATHE 101
- TITAN | ROCKET SERIES

LATHE 201
- TITAN | CHESS SERIES
CURRICULUM DESCRIPTION

**MILL 101: BUILDING BLOCKS**
This ten part series will teach students how to design, program, and machine parts that meet print specifications on a 3-Axis Mill.

**LATHE 101: ROCKET SERIES**
This ten part series will teach students how to design, program, and machine parts that meet print specifications on a 2-Axis Lathe.

**MILL 201: THE ART OF FIXTURING**
This series takes students into the realm of automation. Students will learn how to maximize their machine’s work envelope by creating custom fixturing plates. Run hundreds of parts at a time using these skills and techniques.

**LATHE 201: THE CHESS SERIES**
This series will teach students how to design, program, and machine an epic chess set on a Lathe with Multi-Axis Live Tooling.

**MILL 401: THE 5-AXIS SERIES**
This series will teach students how to design, program, and machine parts that meet print specifications on a 5-Axis Mill.

**LATHE 301: AEROSPACE CONNECTIONS**
This series will teach students how to design, program, and machine parts with tight-tolerances that meet print specifications on a 3-Axis Mill.
Students will learn step-by-step how to design their own 3D model. Through the process they will learn to read a dimensioned print and draw solid models (parts & assemblies) using the Autodesk Fusion 360 CAD Software. By beginning with CAD, students become fundamentally aware of the critical features of their part.

LEARN THESE SKILLS

- Sketch Shapes
- Create Features
- Modify Features
- Create Assemblies
- Create 5-Axis Parts and Fixtures Using Multiple Planes
- And More
Students will learn step-by-step how to program the solid model you created in the first step. Through the process they will learn to control a CNC Machine using Advanced CAM Software and create the code needed to machine parts in real life. Understanding the simulation will give students the competence they need to understand tool paths and machine with confidence.

**LEARN THESE SKILLS**

- Set-Up Part Material Type and Location of Part in Stock
- Define Coordinate System (Program's Point of Origin)
- Apply Tool Paths to a Solid Model
- Verify Operation through 3D Simulation
- Post Final Code to Specified CNC Machine
- And More
Students will learn step-by-step how to machine the model they designed and programmed. Through the process they will learn set-up, tooling, and operation of a CNC Machine. Once your students finish their parts, they will verify all dimensions and tolerances using a First Article Inspection Sheet and educators will validate their work.

LEARN THESE SKILLS & TECHNIQUES

- GD&T (Geometric Dimensioning & Tolerancing)
- Facing
- Profiling (Series of Complex Shapes)
- Pocketing (Closed, Open & Through)
- Chamfering (Multi-Level, Adjusted Off-Set)
- O-Ring Grooves (Top & ID Radial)
- Key Cutter Slots
- Counter Bores
- Tapping/Threading (ID Threads)
- Engraving
- Islands
- Mirroring
- 3D Multi-Axis Surfacing
- Aerospace Honeycomb
- Metrology
- And More
## REQUIREMENTS & RECOMMENDATIONS

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<tr>
<td>• Desktop or Portable Computer</td>
<td>• Properly Trained Instructor</td>
<td>• 3D CAD/CAM Mouse</td>
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<td>• Autodesk Fusion 360¹</td>
<td>• TITAN Fundamentals Mill Checklist</td>
<td>• Building Blocks Tool Kit⁴</td>
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<td>• Print for Each Part</td>
<td>• FA Inspection Report for Each Part²</td>
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<td>• Tool Libraries</td>
<td>• CNC Machine</td>
<td>• The Art of Fixturing Kit⁵</td>
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<td>• Setup Sheet for Each Part</td>
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¹ System Requirements: Apple Mac® OS® X El Capitan (10.11.x), OS® X Sierra (10.12.x), OS® X High Sierra (10.13.x), Microsoft® Windows® 7 SP1 or Microsoft® Windows® 8.1, Windows® 10, CPU: 64-bit processor (32-bit not supported), Memory: 3GB RAM (4GB or more recommended), An internet connection of 5mbits/s or faster (10mbits/s recommended for Simulation Solves), Disk space: ~3.5GB, Graphics Card: 512MB GDDR RAM or more, except Intel GMA X3100 cards, Printing device: Microsoft-compliant mouse, Apple Mouse, Magic Mouse, MacBook Pro Trackpad.

² First Article (FA) Inspection Reports should be completed by both the student and the teacher for each part in the Building Blocks Series. The Inspection Report will determine whether a student repeats the process (fail) or moves onto the next part in the series (pass). If the student fails to meet all dimensional call-outs, the student will troubleshoot and machine another part (or parts) until the part meets the call-outs on the print.

³ Building Blocks: 1" X 2" Rectangle 6061-T6 Aluminum. The TITAN Rocket: 1" Diameter Rod 6061-T6 Aluminum.

⁴ Academy Tool Kits available wherever you buy Kennametal Tools.

⁵ Academy Fixture Kit available wherever you buy Mitee-Bite Workholding Products.
The Academy Tool Kits contain advanced carbide tooling by Kennametal and advanced workholding clamps, pins, and grips by Mitee-Bite. These kits reduce costs for education programs by tens of thousands of dollars and allows students to become comfortable and confident with each fundamental tool. The Tool Kits can be expanded and upgraded as educators and students progress through each series.
“WE’VE GONE FROM A PROGRAM THAT TEACHES STUDENTS HOW TO MACHINE, TO ONE THAT CREATES MACHINISTS.”

DAN FRANK | Rocklin High School
JOIN THE REVOLUTION

👩‍💻 Sign up for your free account on the TITANS of CNC: Academy: academy.titansofcnc.com/signup
👉 Download FREE CAD/CAM Software provided by Autodesk: academy.titansofcnc.com/education/free-cad-cam-software
💻 Start your first TITAN LEARNING SERIES with the TITAN Building Blocks: academy.titansofcnc.com/category/mill-building-blocks
🔍 Find an Academy Small Group in your area to begin machining today: academy.titansofcnc.com/education/small-groups
✔️ See why over 800 businesses and schools have endorsed the Academy: http://academy.titansofcnc.com/endorsements
🤖 Join the conversation on our Academy Facebook Group: https://www.facebook.com/groups/titansofcncacademy
👨‍🏫 Sign up for our upcoming Live Workshops at our West Coast Training Facility: https://titansofcnc.typeform.com/to/WPhnQw
💬 Connect with other Academy members on the TITAN Forum: titansforum.titansofcnc.com
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