



TITANS
of CNC

ACADEMY

INSTRUCTION MANUAL

ACADEMY.TITANSOFCNC.COM

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

DEVELOPED BY CNC EXPERTS

Our unique approach to CNC education will teach your students to machine real parts up to 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.

PROJECT-BASED LEARNING

We teach your students the fundamentals of CNC machining, fixturing, live tooling, and advanced 5-axis machining through repetition and the stacking of techniques. Each video tutorial walks students step-by-step through the entire manufacturing process.

STANDARDIZED MATERIAL

Each unique Academy part is designed to fit within a standardized work envelope. Students can effectively create multiple parts, achieving the comprehension that is needed to solve industry problems and realize success in the real world.

STANDARDIZED TOOLING

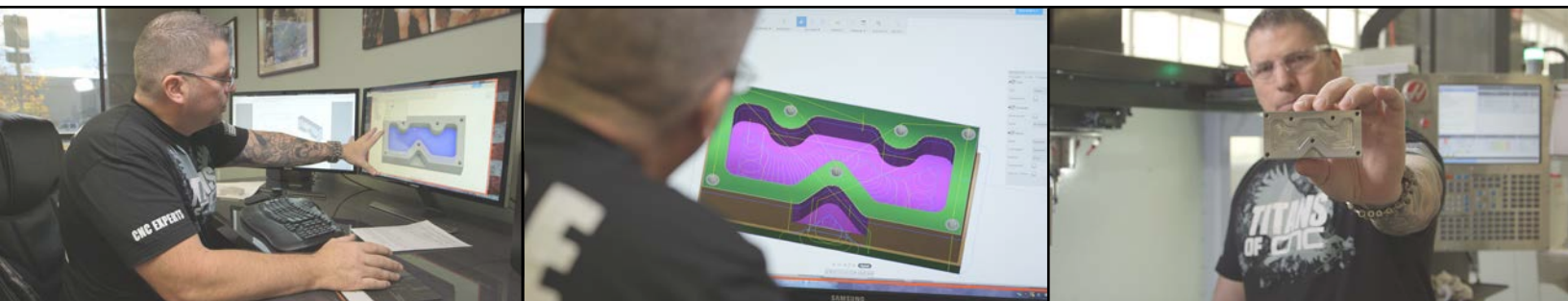
We standardized tooling to reduce costs for education programs and to allow students to become comfortable and confident with each fundamental tool. We assembled advanced carbide tooling by Kennametal and workholding clamps, pins, and grips by Mitee-Bite at an incredible price. The Academy Tool Kits can be expanded and upgraded as educators and students progress through each series.

LEARN ANYWHERE

Learn how to design, program, and machine complete parts that meet print specifications in the classroom or in your own home. This modernized approach gives users a head-start in their careers and prepares them to make parts that matter in real CNC production environments.

BECOME TITANS OF CNC: ACADEMY CERTIFIED

TITAN Certifications have the backing of the industry which validates the student's knowledge and advances their opportunities in a manufacturing career.



START HERE

1

REGISTER for a FREE [TITANS of CNC: ACADEMY](#) account

2

DOWNLOAD and install [MASTERCAM EDUCATIONAL SUITE](#), [SOLIDWORKS STUDENT EDITION](#), or [AUTODESK FUSION 360](#)

3

DOWNLOAD and import the KENNAMETAL TOOL LIBRARIES for [THE TITAN BUILDING BLOCKS](#) and [THE TITAN ROCKET SERIES](#)

4

DESIGN 3D models in [THE TITAN BUILDING BLOCKS](#) or [THE TITAN ROCKET](#) series, by reading the dimensioned prints and following along with the CAD tutorials

5

PROGRAM 3D models in [THE TITAN BUILDING BLOCKS](#) or [THE TITAN ROCKET](#) series, by reading the dimensioned prints, setup sheets, and following along with the CAM tutorials

6

PURCHASE TITANS OF CNC: Academy Tool Kits powered by [KENNAMETAL](#) and [MITEE-BITE](#) (or equivalent tooling and workholding)

7

SETUP your CNC machine by following [THE MILL](#) or [THE LATHE](#) setup checklists

8

MACHINE each part by watching the CNC tutorial and following machine safety guidelines

COMPUTER AIDED DESIGN

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 deeply aware of the critical features of their part.

SKILLS DEMONSTRATED

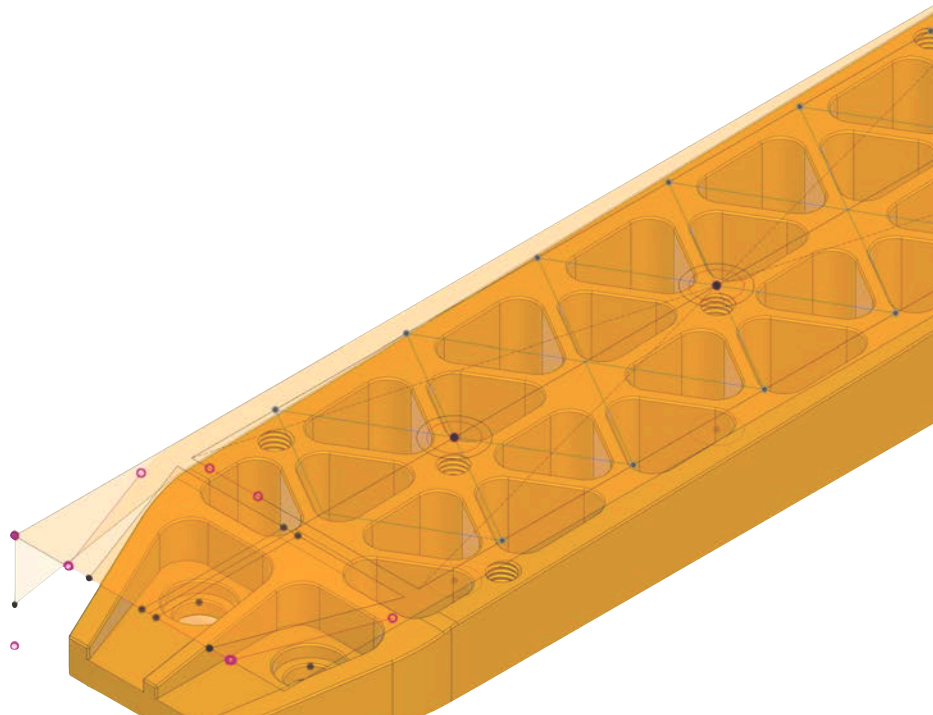
- sketch shapes
- create features
- modify features
- create assemblies
- efficient sketching techniques
- and more

REQUIREMENTS

- desktop or portable computer
- part specifications (print)

RECOMMENDED

- 3D CAD/CAM mouse
- Autodesk Fusion 360



COMPUTER AIDED MANUFACTURING

Students will learn step-by-step how to program the solid model they created in the design step. Through the process they will learn to control a CNC machine using Autodesk Fusion 360 CAM software and create the code needed to machine parts in real life. Running the simulation will give students the competence they need to understand tool paths and machine with confidence.

SKILLS DEMONSTRATED

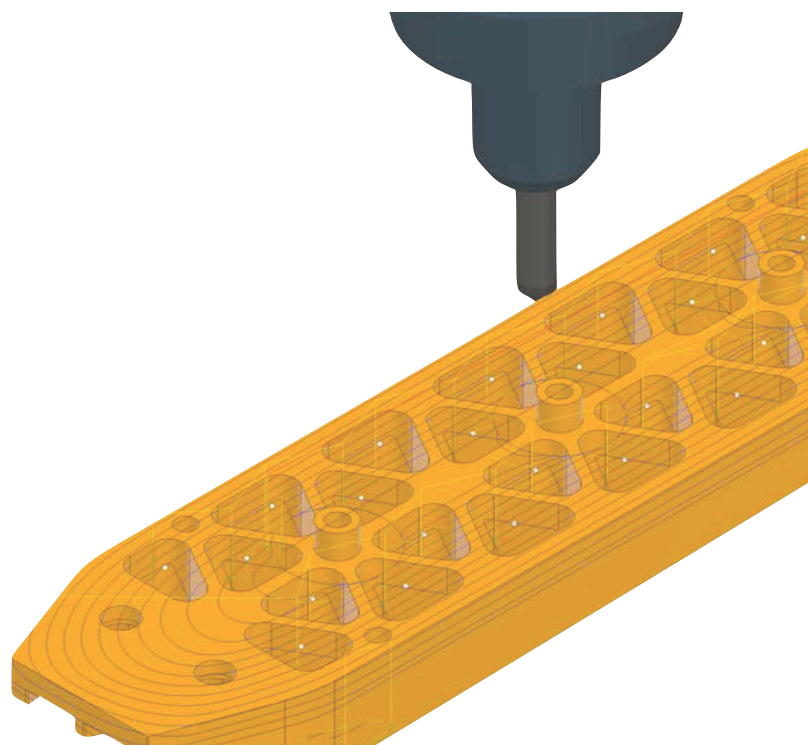
- define and orient stock material
- establish coordinate system (program's point of origin)
- apply tool paths to a solid model
- verify operation through 3D simulation
- post final code to specified CNC machine
- and more

REQUIREMENTS

- desktop or portable computer
- part specifications (print)
- tool library
- setup sheet

RECOMMENDED

- 3D CAD/CAM mouse
- Autodesk Fusion 360



COMPUTER NUMERICAL CONTROL

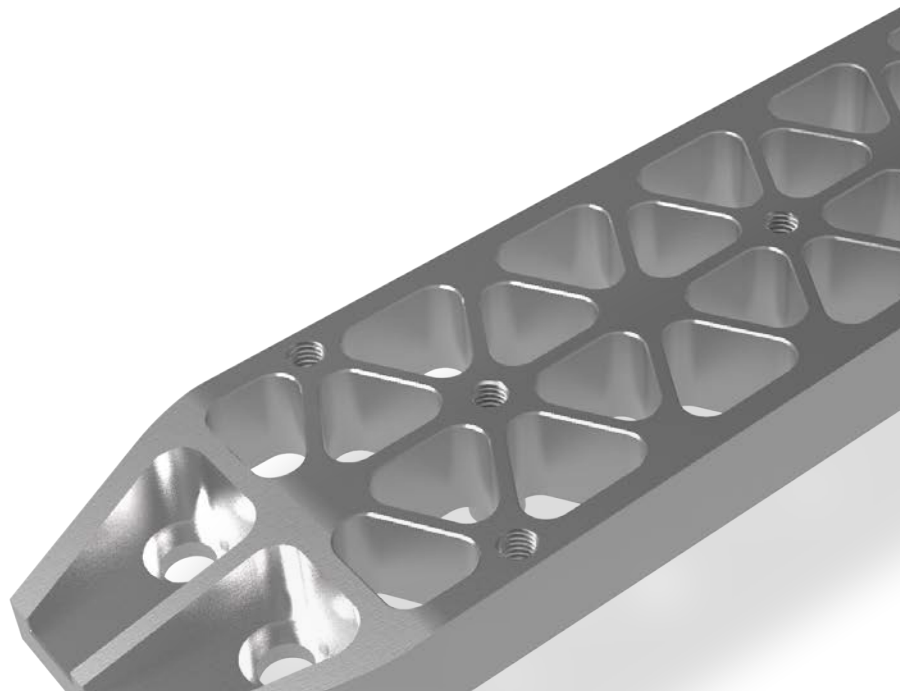
Students will learn step-by-step how to machine the model they designed and programmed. Through the process they will learn set-up, tooling, and operation of a CNC machine. When students finish their parts, they will verify all dimensions and tolerances using a First Article Inspection Report and educators will validate their work.

SKILLS DEMONSTRATED

- geometric dimensioning & tolerancing (GD&T) competence
- 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
- 3D multi-axis surfacing
- aerospace honeycomb
- metrology
- and more

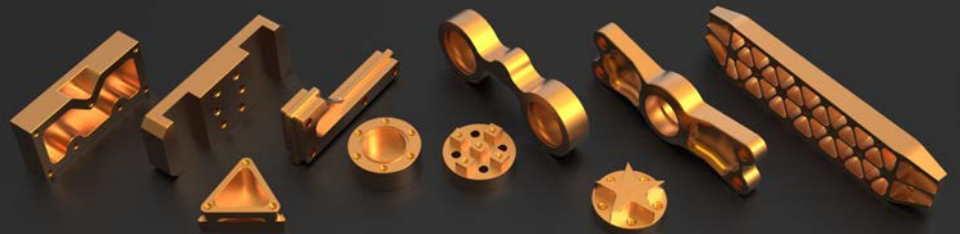
REQUIREMENTS

- properly trained instructor
- TITAN Fundamentals mill checklist
- TITAN Fundamentals lathe checklist
- FA Inspection Report
- CNC machine
- standardized material
- standardized tooling
- inspection tools



TITANS OF CNC: MILL CURRICULUM

M101
3-AXIS



TITAN | BUILDING BLOCKS

M201
3-AXIS



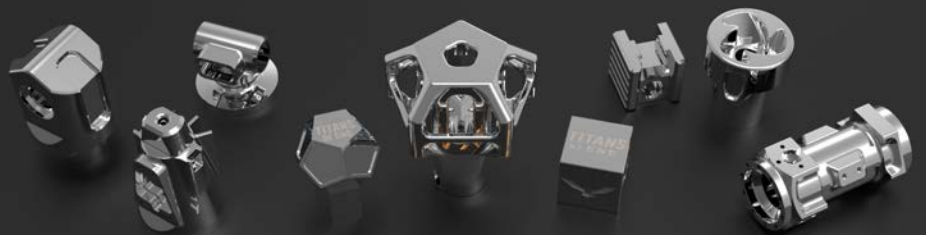
TITAN | THE ART OF FIXTURING

M301
3-AXIS



BB | AERO
BUILDING BLOCKS AEROSPACE

M401
5-AXIS



TITAN | 5-AXIS SERIES

TITANS OF CNC: LATHE CURRICULUM

L101
2-AXIS



TITAN | ROCKET SERIES

L201
LIVE
TOOLING



TITAN | CHESS SERIES

L301
LIVE
TOOLING



TITAN | AEROSPACE CONNECTIONS

L401
LIVE
TOOLING



BB | AERO
BUILDING BLOCKS AEROSPACE

TITANS OF CNC: ACADEMY CASE STUDY













“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
-  Exclusive Offers on CAD/CAM software from Mastercam or Solidworks
-  Start your first TITAN Learning Series with the TITAN Building Blocks
-  Find an Academy Small Group in your area to begin machining today
-  See why over 1,000 companies and institutions have endorsed the Academy
-  Join the conversation on our Academy Facebook Group
-  Connect with other Academy members on the TITAN Forum
-  Subscribe to our YouTube channel for the latest TITAN videos
-  Watch all 3 seasons of the TITANS of CNC television series
-  Shop for TITANS of CNC merchandise at the TITANS of CNC store

MADE POSSIBLE BY



Doosan Machine Tools 

Mastercam

Blaser.
SWISSLUBE

 **TORMACH**

 **SOLIDWORKS**

Mitutoyo

HAIMER.

LNS

FANUC

SCHUNK 



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