



MACHINE SHOP 101

COURSE SYLLABUS AND LESSON PLAN

29 Instruction Hours ♦ 72.5 Study Hours ♦ Self-paced—completed within 1 to 12 Months

No Prerequisites ♦ Certificate in Machining Theory ♦ Distance Education only; Online only

COURSE DESCRIPTION: This comprehensive Machining Course comes in 3 sections:

Section 1—Lathe: More than 12 hours of detailed instruction on the set-up and operation of the Machine Lathe. Students will learn how to set-up the machine, turn, bore, thread, knurl and taper metal. Section 2—The Vertical Milling Machine: More than 12 hours of video instruction detailing everything the student needs to know to run a vertical mill including fly cutting, indexing, boring, milling aluminum, steel and plastics, clamping, fixturing, digital read-out and more. Section 3—General Machine Shop Techniques: More than 5 hours of video. Students learn how to properly operate all the support equipment needed in a shop: belt sanders, bead blasters, grinders and surface grinders, plus learn how to sharpen drill bits, remove broken screws, detailed shop planning and set-up, and advanced equipment and techniques.

Students will learn from a professional currently working in the field with more than 3 decades of experience. Students will see up close views of the instruction so they can quickly learn the fine detail of precision machining. Students study and complete the course at a pace they control, with sufficient retention of the knowledge to pass their exams with a score of 80% or higher.

COURSE OBJECTIVE: Completion of this Machining Course prepares an individual for entry-level employment or pre-apprentice positions in the machining trade in positions classified under Machinist (*SOC 51-4041 Idaho Department of Labor*). Examples of pre-apprentice position titles are Machine Technician, Millwright, Aircraft Systems Technician, and Engine and Machines Technician. Additionally, this course prepares individuals for employment in positions involving entry-level machining work classified as “maintenance” under General Maintenance and Repair (*SOC 49-9042 Idaho Department of Labor*) in position titles such as Maintenance, Maintenance Mechanic, and Facilities Maintenance Technician.

- *Unless required by an employer, no certification, license, or registration is required for most employees working in the machining trade or for machining work performed as part of maintenance jobs.*
- *Certificates of this School do not qualify an individual to work as a registered or licensed, independent Contractor.*
- *Machinists train in many ways: informally on the job, in apprenticeship programs, at vocational schools, and in community and/or technical colleges. To boost the skill level of machinists, a number of certifications including Journey-level certification programs are also now available from*



state apprenticeship boards after completing an apprenticeship. Though special educational credentials or certification(s) are not required to do machining work, it can lead to better job opportunities. For more information, go to www.bls.gov.

Machining Course Syllabus (continued)

EQUIPMENT AND MATERIALS USED IN THIS COURSE

Equipment and materials used in this course include: An internet-capable computer, internet connection, web browser.

VIDEO INSTRUCTION: *Professional Machine Shop Course*. Director Gene Kelly, Producer Keith Hezmalhalch, Instructor Darrell Holland. Accelerated Training Institute (ATI), 2011.

TEXTBOOK: Machining does not include a textbook

INSTRUCTIONAL MODE: Distance education not in real time. All instruction is provided via pre-recorded video lessons.

FREQUENCY OF LESSONS: Lessons occur at a time and location determined by the student.

METHOD OF INSTRUCTION: This course is taught in pre-recorded video instruction; however, the students can access Student Support Specialists whenever they have technical questions or need assistance with completing the coursework. Students submit their questions by email to faculty@atitradeschools.com, after which they will receive an email reply and/or a telephone call from a Student Support Specialist.

TESTING AND CERTIFICATE REQUIREMENTS: When you complete the video instruction in the Machining Course, you will take an online examination to test your knowledge. Exams are online, not timed, and are open book, open video. Once started, an online exam may be suspended but must be completed within 60 days. When you pass all video instruction exams with a score of 80% or higher, you will receive a Machining Theory Certificate.

GRADING SYSTEM: Students are graded on a pass/fail basis.

Passing Grade: A passing grade is given to a student who achieves a score of 80% or higher on all examinations in the Machining Course.

Failing Grade: A failing grade is given to a student who has failed to achieve a score of 80% or higher on all examinations in the Machining Course



Machining Course Lesson Plan

Watch all video instruction for the following segments:	✓ In Progress	✓ Completed
Section 1 The Lathe Introduction Cutting Tools Measuring Tools Lathe Setup		
The Lathe (continued) Raw Material Selection Making a Precise Cut Feed Rates		
The Lathe (continued) Tapers Threading Internal Threading		
The Lathe (continued) Boring Holes Knurling Advanced Operations		
Section 2 The Vertical Mill Getting to Know the Vertical Mill Safety, Set-up and Fixtures		
The Vertical Mill (continued) Cutters and Milling Operation Basic Metallurgy, Set-up and Truing		
The Vertical Mill (continued) Speeds, Feeds and Measuring Feeds and Speeds: The Real World		
The Vertical Mill (continued) Practice #1 Drilling, Tapping and Reaming		
The Vertical Mill (continued) Boring		



Shaping and Digital Readouts		
The Vertical Mill (continued) Slots and Production Fixtures Accessories and Tooling Inspection		



Machining Course Lesson Plan (continued)

Watch all video instruction for the following segments:	✓ In Progress	✓ Completed
Section 3 General Machine Shop Support Equipment and Shop Setup-Section 1 Support Equipment and Shop Setup –Section 2		
General Machine Shop (continued) Support Equipment and Shop Setup-Section 3		
General Machine Shop (continued) The Automotive Brake Lathe Small Engine Boring		
General Machine Shop (continued) IMTS 2002 Interviews The Matrix 800 Automated CNC Mill Victor Machines Manual/CNC Lathe Bore Welder Jet Edge Technologies Water Cutting Gleason Gear Cutter The EDM Process (Electrical Discharge Machining) IMTS 2002 Wrap-up		
General Machine Shop (continued) Support Equipment and Shop Setup Machining a Part from Start to Finish Lathe/Mill Combination Machines		