

COMPETENCY PROFILE



MACHINE TECHNOLOGY I

BTC: MACH 101 (2 credits)

This course is designed to cover basic machine tool operation & safety on grinders, lathes, mills & drills. This course combines both theory (MACH 101) & practice (MACH 119). Students are expected to cover specific course content through assigned textbook readings & then practice the learned techniques in the machining lab. **To earn college credit for this course, students must successfully complete one full year of instruction covering MACH 101 & MACH 119.**

Drilling

- Describe shop safety precautions for drilling.
- Describe/identify main parts of drill presses.
- Understand & describe parts of twist drill.
- Identify system of drill sizes.
- Identify angles & clearances of twist drill for sharpening.
- Measure the size of drills.
- Describe holding devices for work & tooling.
- Describe techniques to sharpen drills.
- Grind proper angles on twist drill.
- Perform standard drilling operations.
- Calculate drilling speeds, reaming & counter sink speeds.
- Demonstrate layout & drilling in accurate locations.
- Identify & describe hand & machine reamers & allowances for reaming.
- Identify & describe counterbore & countersink, tapping & transfer of holes.

Textbook Readings/Assignments:

Section 11: pages 179-210

- Unit 19 Drill Press Types (pg 181-187; answer questions 1-11 on page 187)
- Unit 20 Twist Drills (pg 189-197; answer questions 1-15 on page 197)
- Unit 21 Producing & Finishing Holes (pg 199-209; answer questions 1-21 on page 210)

Drilling Assignments/Assessment:

See MACH 120 Competency Profile for lab assignments

Grinder

- Describe shop safety practices for grinding.
- Describe safety rules to operate grinders.
- Define trueing & dressing of grinding wheels.
- Select proper grit size to sharpen cutting tools.

Textbook Readings/Assignments:

Section 14: pages 361-372

- Unit 37 Grinders (pg 361-372; answer questions 1-29 on page 372)

Grinding Assignments/Assessment: See MACH 120 Competency Profile for lab assignments

If Available: Review Film Strips

Introduction to Pedestal Grinder
Grinding Wheel Construction
Grinding Safety
Introduction to Surface Grinder
Truing & Dressing

Lathe

- Demonstrate understanding of shop safety practices; identify safety precaution areas.
- Understand & describe the basic parts of a lathe.
- Understand & perform the surface feet to RPM calculations.
- Understand & describe how to select the speeds & feeds for all turning operations.
- Define steps for basic set up & operation of lathe, layout process & hand tools.
- Understand & perform the calculations for thread cutting; calculate pitches of threads & thread depths.
- Understand & describe how to select the proper cutter.
- Understand & describe the different styles of threads.
- Define techniques to identify & sharpen basic turning tools.
- Identify work & tool holding devices.

Textbook Readings/Assignments:

Section 12: pages 211-310

- Unit 22 Lathe Types (pg 213-221; answer questions 1-18 on page 221)
- Unit 23 Lathe Accessories & Tooling (pg 223-230; answer questions 1-14 on page 231)
- Unit 24 Cutting Speeds & Feeds (pg 233-237; answer questions 1-7 on pages 237-238)
- Unit 25 Mount & Remove Accessories (pg 239-248; answer questions 1-11 on pages 248-249)
- Unit 26 Mount Work Between Centers (pg 251-258; answer questions 1-10 on page 258)
- Unit 27 Machining Between Centers (pg 259-265; answer questions 1-13 on page 265)
- Unit 28 Knurling, Grooving & Shoulder Turning (pg 267-273; answer questions 1-11 on page 273)
- Unit 29 Taper Turning (pg 275-284; answer questions 1-24 on pages 284-285)
- Unit 31 Threads & Thread Cutting (pg 299-309; answer questions 1-22 on pages 309-310)

Lathe Assignments/Assessment: See MACH 120 Competency Profile for lab assignments

College Textbooks:

Machine Tool & Manufacturing Technology (or equivalent with instructor approval)
Machinery's Handbook