

PRECISION MACHINING PROGRAM

For information on registering and enrolling visit mlatc.edu/start
 For information on tuition, fees and costs visit mlatc.edu/costs
 For information on delivery methods visit mlatc.edu/delivery
 For information on MATC Certifications visit mlatc.edu/certifications
 For questions please email matcinfo@mlatc.edu or call 801-753-MATC (6282)



CIP CODE 48.0510

Machinists use machine tools that are either conventionally controlled or computer numerically controlled, such as lathes, milling machines, and grinders, to produce precision metal parts. Although they may produce large quantities of one part, precision machinists often produce small batches or one-of-a-kind items. The parts that machinists make range from simple bolts of steel or brass to titanium bone screws for orthopedic implants. Hydraulic parts, anti-lock brakes, and automobile pistons are other widely known products that machinists make. Students will learn the essentials of machining including shop mathematics, blueprint reading, machine tool operation and selection emphasizing safety in the learning process. The program prepares students for a smooth transition into the manufacturing industry work-force and/or to upgrade skills for career advancement. The Machine Tool Program stresses hands-on individualized instruction, through project construction and classroom work. Students will also learn the essentials of setting up, operating and programming Computer Numerically Controlled Machine tools emphasizing safety in the learning process. Students will also learn the essentials of Computer Aided Manufacturing Software. The program prepares students for a smooth transition into the manufacturing industry work-force and/or to upgrade skills for career advancement. The CNC program stresses hands-on individualized instruction, through project construction and classroom work.

OUTCOMES	Delivery Method	DE/DE (min 6 - max 15)
MATC Precision Machining Program Completion Certificate	Enrollment Availability	High School Juniors ,Seniors and Adults
	Financial Aid Available	PENDING
	VA Qualified	PENDING

PREREQUISITES
 As part of the admission process students are required to complete the Career Ready Entrance Assessment. The Career Ready Entrance Assessment is free and takes approximately 1 hour to complete. You can take this assessment at anytime prior to registration. You only need to take this assessment once upon first registering at MATC. You do not need to retake it for each program or additional course. For additional information or to schedule please visit mlatc.edu/testing

SECTION	LOCATION	ROOM	START DATE	END DATE	START TIME	END TIME	DAYS	INSTRUCTOR	NOTES
Fall 2017	Orem	South Campus	8/22/2017	Open Exit	7:30 AM	10:30 AM	M-F	Barry Maxfield, Corey Bates	
			08/22/17	Open Exit	11:45 AM	2:45 PM	M-F	Barry Maxfield, Corey Bates	
			08/22/17	Open Exit	5:15 PM	9:00 PM	M-TH	Todd Christensen, Gary Noren	
Spring 2018	Orem	South Campus	01/16/18	Open Exit	7:30 AM	10:30	M-F	Barry Maxfield, Corey Bates	
			01/16/18	Open Exit	11:45 AM	2:45 PM	M-F	Berry Maxfield, Corey Bates	
			01/16/18	Open Exit	5:15 PM	9:00 PM	M-TH	Todd Chirstensen, Gary Noren	

TUITION /FEES	COST	NOTES
Registration Fee	\$40.00	This \$40 is a one time only, non-refundable fee when enrolling in the college for the first time.
Facilities Fee	\$50.00	
Program Fees	\$850.00	Program fees may not include all textbooks, materials or certification costs. Please see additional required/optional materials.
Tuition	\$2,634.00	
Total Tuition and Fees	\$3,574.00	Tuition and fees are due at time of registration.

REQUIRED PROGRAM MATERIALS	COST	NOTES
Print Reading for Industry 9th Edition By: Walter C. Brown & Ryan K. Brown	\$83.95	ISBN: 10-1-605-25-3081 / ISBN: 13-9781605253084
Machine Shop Practice, Volume I, 2nd Edition by Moltrecht	\$34.95	ISBN: 978-080831111267
Machine Shop Practice, Volume II, 2nd Edition by Moltrecht	\$34.95	ISBN: 978-080831111267
Interpretation of Geometric Dimensioning and Tolerancing, 3rd Edition; By: Daniel E. Puncochar	\$41.94	ISBN: 13-9780831134211

Technical Shop Mathematics, 3rd edition, Thomas Ashatz	\$54.95	ISBN: 978-0831130862					
Machinist Tool Kit	\$1,248.28	Tool kits are available to rent on a first come, first serve, basis (approx. \$100 a month). See instructor for details					
Machinery's Handbook, 30th edition, Tool box edition	\$105.00	ISBN: 978-0831130916					
Programming of CNC Machines by Ken Evans, 4th Edition	\$57.54	ISBN: 978-0-8311-3316-0					
Student Workbook for Programming of CNC Machines	\$25.80	ISBN: 978-0-8311-3317-0					
Total	\$1,687.36						
OPTIONAL PROGRAM MATERIALS	COST	NOTES					
Total	\$5,261.36						
PROGRAM COMPONENTS			LAB	LECTURE	HYBRID	TOTAL	NOTES
Module 1: Introduction to Machining							
Orientation			0	1	0	1	
1. Prepares time or job cards, reports and records and performs housekeeping duties			0	1	0	1	
2. Follows verbal and written instructions to complete work assignments.			0	1	0	1	
Safety and Health of Machinists			0	1	0	1	
1. Safe operating practices, including personal protection equipment(PPE) and SDS			0	1	0	1	
2. Proper operation of saws, grinders, lathes and milling machines.			0	2	0	2	
3. Pass Safety Test			0	1	0	1	
Precision Measurement			0	1	0	1	
1. Systems of Measurement			0	2	0	2	
2. Use of Rulers, Calipers, Micrometers and Height Gages			1	2	0	3	
3. Gage Blocks			0.5	0.5	0	1	
4. Comparison Measuring Tools			2	4	0	6	
5. Angle Measuring Tools			2	2	0	4	
6. Pass Knowledge Test on Precision Measure			0	1	0	1	
7. Layout Work			20	2	0	22	
8. Pass Knowledge Test on Layout			0	2	0	2	
9. Basic Metallurgy			0	2	0	2	
a. Selection and Identification of Steels			1	5	0	6	
b. Selection and Identification of Non-ferrous Metals			1	5	0	6	
c. Hardening, Case Hardening and Tempering			1	5	0	6	
d. Annealing, Normalizing and Stress Relieving			1	5	0	6	
e. Rockwell and Brinell Hardness Testers			1	4	0	5	
10. Bench Work			0	1	0	1	
a. Saws (Powered and Hand), Files, Chisels			0.5	0.5	0	1	
b. Use of the Pedestal/Bench Grinder			0.5	0.5	0	1	
c. Taps and Dies			14	2	0	16	
d. Drill Press, Sharpening Drills, Use of Drills			1	1	0	2	
e. Build T-slot Cleaner			3	0	0	3	
f. Build Drill Gage			4	0	0	4	
11. Tool Geometry			0	6	0	6	
Module 2: Machine Shop Math							
1. Fractions and Mixed Numbers			0	7	0	7	
2. Decimals			0	5	0	5	
3. Exponents			0	6	0	6	

4. Measurement-English and Metric	0	5	0	5	
5. Fundamentals of Algebra	0	7	0	7	
6. Ratios and Proportions	0	6	0	6	
7. Gearing	0	6	0	6	
8. Factoring Algebraic Expressions	0	9	0	9	
9. Geometry	0	12	0	12	
10. Right Angle Trigonometry	0	6	0	6	
11. Shop Trigonometry	0	12	0	12	
Module 3: Blueprint Reading					
1. Prints: the language of industry	0	3	0	3	
2. Lines conventions and lettering	0	2	0	2	
3. Title blocks and parts lists	0	3	0	3	
4. Geometric terms and construction	0	3	0	3	
5. Multiview drawings	0	3	0	3	
6. Section drawings	0	3	0	3	
7. Pass 1st Knowledge Test on Blueprint Reading	0	1	0	1	
8. Auxiliary views	0	3	0	3	
9. Screw thread representation	0	2	0	2	
10. Dimensioning	0	2	0	2	
11. Tolerancing	0	3	0	3	
12. Machining specifications and drawing notes	0	3	0	3	
13. Surface texture symbols	0	3	0	3	
14. Drawing revision systems	0	3	0	3	
15. Detail drawings	0	3	0	3	
16. Assembly drawings	0	3	0	3	
17. Gears splines and serrations	0	3	0	3	
18. Cam diagrams and prints	0	3	0	3	
19. Plastic parts	0	3	0	3	
20. Precision sheet metal parts	0	3	0	3	
21. Pass 2nd Knowledge Test on Blueprint Reading	0	1	0	1	
Module 4: Geometric Dimensioning and Tolerancing					
1. Introduction to GD&T	0	3	0	3	
2. Symbols and Abbreviations	0	4	0	4	
3. Datums	0	4	0	4	
4. Feature Control Frames	0	4	0	4	
5. General Rules of GD&T	0	3	0	3	
6. Form and Orientation Tolerances	0	3	0	3	
7. Virtual Condition	0	3	0	3	
8. Tolerances of Location	0	3	0	3	
9. Calculating True Position	0	3	0	3	
10. Pass Knowledge Test on Geometric Dimensioning and Tolerancing	0	1	0	1	
Module 5: Lathe I					
1. Lathe Safety	0	1	0	1	
2. Lathe Identification and Maintenance	0.5	0.5	0	1	
3. Lathe Machine Controls	0.5	0.5	0	1	
4. Tool Holders and Tool Holding	0	2	0	2	
5. Tool Geometry-Grinding Tool Bits	5	1	0	6	

6. Feeds and Speeds	0	10	0	10	
7. Pass Knowledge Test for Speeds and Feeds	0	2	0	2	
8. Changing Chucks and Mounting the Faceplate	1	0	0	1	
9. Dialing in the Four-Jaw Chuck	2	0	0	2	
10. Truing the Tailstock	1	0	0	1	
11. Turning Between Centers	0.5	0.5	0	1	
a. Bench Vise Guide Bar	3.5	0.5	0	4	
b. Bench Vise Handles	4	0	0	4	
c. Wheel Puller Screw	4	0	0	4	
d. Parallel Clamp Threads	4	0	0	4	
12. Cutting Tapers	0	1	0	1	
a. Compound Taper	1.5	0.5	0	2	
b. Taper Attachment Taper	1	0	0	1	
c. Tailstock Taper	2	0	0	2	
d. Die Stock Handles	2	0	0	2	
e. Cannon Barrel	2	0	0	2	
13. Build a Plumb Bob	3	0	0	3	
14. Build Indicator Holder Parts	6	0	0	6	
15. Build a Deburring Tool	6	0	0	6	
15. Build a Center Punch	3	0	0	3	
16. Introduction to Threads	0	2	0	2	
17. 60 Degree Thread Cutting	0	2	0	2	
a. C-Clamp Thread	4	0	0	4	
b. Die Stock Handles	6	0	0	6	
c. Kant Twist Clamp	6	0	0	6	
d. Parallel Clamp	7	0	0	7	
e. Bench Vise Screw	5	0	0	5	
18. Build a Machinist Jack	14	0	0	14	
Module 6: Lathe II					
1. Safe Operation of the Lathe	0	1	0	1	
2. Lathe Cutting Fluids	0	1	0	1	
3. Steady and Following Rests	2	0	0	2	
4. Build a Tap Handle	3	0	0	3	
5. Build a Pin and Counter-bored Swivel	6	0	0	6	
6. Make a Bearing Bore	3	0	0	3	
7. Make a Wheel Puller Nut	3	0	0	3	
8. Make Pool Table Legs	12	0	0	12	
9. Make Dart Set	15	0	0	15	
10. Build Kant Twist Clamp Parts	14	0	0	14	
11. Build Bench Vise Parts	14	0	0	14	
12. Build a Double Start Thread and Nut	10	0	0	10	
Module 7: Mill I					
1. Milling Machine Safety	0	1	0	1	
2. Milling Machine Identification	0.5	0.5	0	1	
3. Cutting Tools and Holders for the Mill	0	3	0	3	
4. Trimming the Milling Machine	2	0	0	2	
5. Dialing in a Vise	1	0	0	1	

6. Mounting Work Directly to the Mill	0.5	1.5	0	2	
7. Squaring a Block	0	1	0	1	
a. Tap Wrench Blocks	2	0	0	2	
b. Kant Twist Clamp Blocks	2	0	0	2	
c. Bench Vise Spacer Block	2	0	0	2	
d. Bench Vise Moveable Jaw Block	2	0	0	2	
8. Build Wheel Puller Arms	9	0	0	9	
9. Dialing in a Hole	1	0	0	1	
10. Locating an Edge with an Indicator and Edge Finder	1	0	0	1	
11. Build a Part-Stop	4	0	0	4	
12. Build C-Clamp Body	8	0	0	8	
13. Special Operations: Reaming, Countersinking, Counterboring, Chamfering and G	1	1	0	2	
a. Tap Wrench Blocks	2	0	0	2	
b. Kant Twist Clamp Blocks	2	0	0	2	
c. Bench Vise Spacer Block	2	0	0	2	
d. Bench Vise Moveable Jaw Block	2	0	0	2	
14. Build a Parallel Clamp	10	0	0	10	
15. Build Model Cannon Side Frames	10	0	0	10	
16. Build Bench Vise Parts	24	0	0	24	
17. Build Indicator Holder	24	0	0	24	
Module 8: Mill II					
1. Work-holding Methods	0	3	0	3	
2. Milling Cutting Fluids	0	1	0	1	
3. Keyway and Key Seat Practice	2	0	0	2	
4. Milling a T-slot	1	0	0	1	
5. Build a Mini Pool Table	18	0	0	18	
6. Build a Fly Cutter	15	0	0	15	
7. Fly Cutting Practice	0.5	0.5	0	1	
a. Bench Vise	1	0	0	1	
b. Mold Halves	2	0	0	2	
8. Build a Puzzle	24	0	0	24	
9. Build a Die Stock Body using the Boring Head	8	0	0	8	
10. Build Kant Twist Clamp Sides using the Rotary Table	12	0	0	12	
11. Finish Wheel Puller Body using the Horizontal Mill	10	0	0	10	
12. Build Cannon Wheels using the Indexing Head	12	0	0	12	
13. Build the Boney Fish Mold	30	0	0	30	
14. Build a Turner's Cube	20	0	0	20	
Module 9: Introduction to CNC Machining					
1. CNC Machines	0	15	0	15	
2. CNC Programming	0	15	0	15	
3. CNC Setup and Operations	0	15	0	15	
Module 10: CNC Machining Center I					
1. Machining Center Programming	6	12	0	18	
2. Machining Center Operations	10	5	0	15	
3. Programing and Operations MC1A	14	1	0	15	
4. Programing and Operations MC1B	14	1	0	15	
5. Programing and Operations MC1C	14	1	0	15	

6. Programing and Operations MC1D	23	1	0	24	
7. MC1 Final Project	32	1	0	33	
Module 11: CNC Turning Center I					
1. Turning Center Programming	8	16	0	24	
2. Turning Center Operations	10	5	0	15	
3. Programing and Operations TC1A	14	1	0	15	
4. Programing and Operations TC1B	14	1	0	15	
5. Programing and Operations TC1C	17	1	0	18	
6. Programing and Operations TC1D	14	1	0	15	
7. TC1 Final Project	23	1	0	24	
Module 12: CAD/CAM Mastercam					
1. Introduction to CAD	10	5	0	15	
2. CAD Solids	10	5	0	15	
3. Itroduction to CAM	10	5	0	15	
4. CAM Solids	10	5	0	15	
Module 13: CNC Machining Center II					
Mastercam Programming MC2A:	8	1	0	9	
Mastercam Programming MC2B:	8	1	0	9	
Mastercam programming MC2C:	8	1	0	9	
Mastercam programming MC2D:	11	1	0	12	
Mastercam programming MC2E:	17	1	0	18	
Module 14: CNC Turning Center II					
Mastercam Programming TC2A:	8	1	0	9	
Mastercam Programming TC2B:	8	1	0	9	
Mastercam programming TC2C:	8	1	0	9	
Mastercam programming TC2D:	8	1	0	9	
Mastercam programming TC2E:	14	1	0	15	
Module 15: Multi-Axis Machining/Mazak Mazatrol					
Multi-Axis Machining:	6	3	0	9	
Mazak Mazatrol:	6	6	0	12	
Mazatrol Programming 1 and 2:	11	1	0	12	
Mazatrol Programming 3:	8	1	0	9	
Mazatrol Programming 4:	8	1	0	9	
Mazatrol Programming 5:	8	1	0	9	
Mazatrol Programming 6:	16	2	0	18	
Total	911.5	405.5	0	1317	Average 21.95 months or 439 days excluding wknds and holidays
***** Additional Information *****					
MATC provides training for students to prepare to take and/or receive MATC or 3rd party licensures and certifications such as state, national or industry certifications. MATC does not guarantee MATC or 3rd party licensures and certifications such as state, national or industry certifications upon completion of MATC Programs. State/national licensure or industry certifications are required for employment in some occupations and it is the responsibility of the student to obtain them. In order to receive a MATC certificate students must demonstrate all competencies.					
Financial Aid availability may be based on program locations and/or scheduling requirements.					
The time it takes to complete this program is based on clock hours. Based on how many hours per day and how many days per week your program meets you can determine your targeted completion date.					
Classes not meeting the minimum enrollment may be cancelled or rescheduled. Minimum enrollment requirements vary per program.					
Information, including but not limited to, times, dates, locations, tuition, fees, prerequisites, etc. are subject to change without notice. It is the viewer's responsibility to verify the timeliness and accuracy of this information prior to enrollment.					
*Summer Schedule: Classes will be held at normal times but during the summer there are no class on Fridays					