

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

Precision Machining Program	Delivery Method	DE/DE (min 6 - max 15)
	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	14:45	M-F		
			08/22/17	Open Exit	6:00 PM	9:45 PM	M-TH		
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		
			01/16/18	Open Exit	6:00 PM	9:45 PM	M-TH		

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	\$3,549.00	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. Puncocchar	\$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, 3rd 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	\$5,236.36	

PROGRAM COMPONENTS	LAB	LECTURE	HYBRID	TOTAL	NOTES
Math for Trades					
Math I:					
Fractions and Mixed Numbers	0	7		7	
Decimals	0	5.5		5.5	
Exponents	0	5.5		5.5	
Measurements - English & Metric	0	5		5	
Fundamentals of Algebra	0	7		7	
Math II:	0			0	
Ratios and Proportions	0	5.5		5.5	
Gearing	0	5.5		5.5	
Factoring Algebraic Expressions	0	9.5		9.5	
Geometry	0	11.5		11.5	
Right Angle Trigonometry	0	6		6	
Shop Trigonometry	0	12		12	
Introduction to Machining					
Orientation	0	1		1	
Safety Equipment	0	1		1	
Hazards of the shop	0	1		1	
Understanding the MSDS	0	1		1	
Pass Safety Test	0	1		1	
Systems of Measurement	0	2		2	
Use of Calipers, Micrometers and Height Gages	0	2		2	
Gage Blocks	0	1		1	
Spring Calipers	0	1		1	
Telescope gages	0	2		2	
Small hole gages	0	1		1	
Machinist squares	0	1		1	

Indicators and Comparators	0	2	2
Passes practical test on precision measurements	0	2	2
Sine bars	2	1	3
Sine plates	1	1	2
Scribe work	1	1	2
Surface plate work	1	1	2
Center punch work	0.5	0.5	1
Height gage/height master	0.5	0.5	1
Layout t-slot cleaner	11	0	11
Layout drill gage	11	0	11
Passed practical knowledge written exam for layout work	0	2	2
Saws/files/chisels	1	1	2
Pedestal/benchgrinders	1	1	2
Taps and dies	1	1	2
Drill press, hand sharpening of drills, drills	1	1	2
Complete slot cleaner	11	0	11
Complete drill gage	11	0	11
Selection and identification of steel	4	2	6
Selection and identification of non-ferrous metals	3	3	6
Hardening, case hardening, and tempering of steel	3	3	6
Annealing, normalizing, and stress relieving	3	3	6
Rockwell and Brinell hardness testers	3	3	6
Blueprint Reading			
Prints: the language of industry	0	3	3
Line Conventions and lettering	0	2	2
Title blocks and parts list	0	3	3
Geometric terms and construction	0	3	3
Multiview drawings	0	3	3
Section drawings	0	3	3
Pass knowledge test for Blueprints I	0	1	1
Auxiliary views	0	3	3
Screw thread interpretation	0	2	2
Dimensioning	0	2	2
Tolerancing	0	3	3
Machining specifications and drawing notes	0	3	3
Surface texture symbols	0	3	3
Drawing revision systems	0	3	3
Detail drawings	0	3	3
Assembly drawings	0	3	3
Gear, splines, and serrations	0	3	3
Cam diagrams and prints	0	3	3
Plastic parts	0	3	3
Precision sheet metal parts	0	3	3
Pass knowledge test for Blueprints 2	0	1	1
Introduction to GD&T	0	3	3
Symbols and abbreviations	0	4	4
Datums	0	4	4
Feature control frames	0	4	4
General rules of GD&T	0	3	3
Form and orientation tolerances	0	3	3
Virtual condition	0	3	3
Tolerances of location	0	3	3
Calculation true position	0	3	3
Pass knowledge test for blueprint reading and GD&T	0	1	1
Lathe I			
Lathe Safety	0	1	1
Lathe Identification and Maintenance	0	1	1
Lathe Machine Controls	0	1	1
Tool Holders and Tool Holding	0	2	2
Tool Geometry-Grinding Tool Bits	6	0	6
Feeds and Speeds	12	0	12
Changing Chucks and Mounting the Faceplate	3	0	3
Dialing in the Four Jaw Chuck	9	0	9
Truing the Tall Stock	9	0	9
Turning Between Centers	12	0	12
Cutting Tapers	12	0	12
Other Lathe Operations	12	0	12
Introduction to threads	10	0	10
60 Degree Thread Cutting	10	0	10
Making a Center Punch	20	0	20
Lathe II			
Lathe Cutting Fluids	0	1	1
Reaming	2	3	5
Countersinking and Counterboring	5	5	10
Build a threaded bar	15	0	15
Build a Tap Handle	15	0	15
Build a Pin and Counter Bored Swivel	15	0	15
Build a Hammer	23	0	23
Mill I:			
Milling Machine Safety	0	1	1
Milling Machine Identification	0	1	1
Cutting Tools and Holders For The Mill	1	2	3
Tramming The Milling Machine/Dialing in a Vise	1	2	3
Mounting Work Directly To The Mill	1	1	2
Squaring a Block	5	1	6
Milling a Angle	9	1	10

Dialing a Hole	3	1		4
Locating an Edge With and Indicator and an Edge Finder	3	1		4
Milling Steps Practice Aluminum and Steel	17	0		17
Build a Part Stop	17	0		17
Build a C-Clamp	17	0		17
Countersinking, Reaming, and Grooving Practice	15	0		15
Build a 1-2-3 Block	20	0		20
Mill II				
Workholding Methods	0	3		3
Mill Cutting Fluids	0	1		1
Keyway and Key Start Practice	5	5		10
Milling a Cavity	10	0		10
Milling a T slot	10	0		10
Build a flycutter	15	0		15
Fly cutting practice	15	0		15
Build a Puzzle	15	0		15
Rotary Table Practice	24	0		24
Indexing Head Practice	27	0		27
Boring Head Practice	15	0		15
Horizontal Mill Practice	15	0		15
Introduction to CNC Machining				
Orientation/History of CNC Machines	2	1		3
Machine Safety and Maintenance	2	1		3
Types and Axis of Movement	2	1		3
Coordinate System	2	1		3
Programming and Formats	2	1		3
Preparatory Functions	2	1		3
Miscellaneous Functions	2	1		3
Points of Reference	2	1		3
Metal Cutting Factors	2	1		3
Tool Clamping Methods	2	1		3
Cutting Tool Selection	2	1		3
Tool Changing and Compensation	2	1		3
Process Planning	3	3		6
Control Systems	2	1		3
CNC Machining Center I				
Machining Center G and M Code	2	1		3
Machining Center Programming	4	2		6
Program Structure	2	1		3
Programming Project #1	5	1		6
Machining Center Control Panel	2	1		3
Control Panel Operations	2	1		3
Machining Center Work Holding	2	1		3
Setting Tools and Work Offsets	2	1		3
Machining Project #1	3	0		3
Cutter Compensation	2	1		3
Programming Project #2	5	1		6
Machining Project #2	6	0		6
Canned Cycles	2	1		3
Programming Project #3	5	1		6
Machining Project #3	6	0		6
Programming Absolute and Incremental	2	1		3
Programming Project #4	5	1		6
Machining Project #4	6	0		6
Subprogramming	2	1		3
Conversational Programming	2	1		3
Programming Project #5	5	1		6
Machining Project #5	12	0		12
Thread Milling	2	1		3
Programming Project #6	9	0		9
Machining Project #6	21	0		21
CNC Turning Center I				
Turning Center G and M Code	2	1		3
Turning Center Programming	4	2		6
Program Structure	2	1		3
Tool Nose Compensation	2	1		3
Multiple Repetitive Cycles	2	1		3
Programming Project #1	5	1		6
Turning Center Control Panel	2	1		3
Control Panel Operations	2	1		3
Turning Center Work Holding	2	1		3
Setting Tools and Work Offsets	2	1		3
Machining Project #1	3	0		3
Drilling and I.D. Machining	2	1		3
Programming Project #2	5	1		6
Machining Project #2	6	0		6
Threading	2	1		3
Programming Project #3	5	1		6
Machining Project #3	6	0		6
Conversational Programming	4	2		6
Programming Project #4	5	1		6
Machining Project #4	9	0		9
Programming Project #5	5	1		6
Machining Project #5	6	0		6
Programming Project #6	9	0		9
Machining Project #6	15	0		15

CAD/CAM Mastercam:				
CAD/CAM	1	2		3
Introduction to Mastercam	3	3		6
Creating Part Geometry	6	3		9
Creating Solid Geometry	6	3		9
Machine Group setup	2	1		3
Generating Tool Paths	6	3		9
Verification	2	1		3
Post Processing	2	1		3
Associativity	2	1		3
Working with Solid Models	6	3		9
Outputting CNC Program Code	2	1		3
CNC Machining Center II:				
Programming Project #1	3	1		4
Machining Project #1	5	0		5
Programming Project #2	3	1		4
Machining Project #2	5	0		5
Programming Project #3	3	1		4
Machining Project #3	5	0		5
Programming Project #4	5	1		6
Machining Project #4	6	0		6
Surfacing	2	1		3
Programming Project #5	6	0		6
Machining Project #5	9	0		9
CNC Turning Center II:				
Programming Project #1	3	1		4
Machining Project #1	5	0		5
Programming Project #2	3	1		4
Machining Project #2	5	0		5
Programming Project #3	3	1		4
Machining Project #3	5	0		5
Programming Project #4	3	1		4
Machining Project #4	5	0		5
Programming Project #5	6	0		6
Machining Project #5	9	0		9
Multi- Axis Machining/Mazak Mazatrol:				
Multi-axis Machining	6	3		9
Introduction to the Mazak Integrex 35	2	1		3
Mazatrol Conversational Programming	6	3		9
Programming Project #1	2	1		3
Machining Project #1	3	0		3
Programming Project #2	2	1		3
Machining Project #2	3	0		3
Programming Project #3	2	1		3
Machining Project #3	6	0		6
Programming Project #4	2	1		3
Machining Project #4	6	0		6
Programming Project #5	2	1		3
Machining Project #5	6	0		6
Programming Project #6	5	1		6
Machining Project #6	12	0		12
Total	974	343	0	1317

***** 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 an 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