



Machine Tool Operation

Program No: 31-420-1

Technical Diploma

Degree Completion Time: Two Terms

In general, an academic year consists of two terms; however, degree completion time may vary based on student scheduling needs and class availability.

2012-2013

Catalog No.	Class Title	Credit(s)	About the Career	Special Note								
Term 1			<p>About the Career</p> <p>Just about every product that you use in your daily activities is the result of a machine tool manufacturing process. If you like hands-on work, are detail-oriented, have good math skills, and are able to develop and follow through on work instructions, a career in machine tool operation offers you lifelong opportunities.</p> <p>Careers</p> <ul style="list-style-type: none"> • CNC Machine Operator • CNC Programmer • Machine Tool Operator • Machine Tool Sales and Service Representative • Supervisor • Tool & Die/Machinist Apprentice • Millwright Apprentice <p>Admissions Steps</p> <ul style="list-style-type: none"> • Application • Application Fee • Entrance Assessment Scores • Transcripts • Program Advising Session • Functional Abilities Statement of Understanding Form <p>Program Outcomes</p> <p>You'll learn to:</p> <ul style="list-style-type: none"> • Develop critical thinking and problem-solving skills. • Develop and follow manufacturing processes and procedures. • Set up and operate manual and computerized metal-cutting machine tools in a safe and efficient manner. • Perform part inspection using hand-held and computerized precision measuring instruments. • Apply basic math, algebra, geometry, and trigonometry concepts to shop projects. • Apply print reading skills to shop projects. <p>Approximate Costs</p> <ul style="list-style-type: none"> • \$126 per credit (resident) • \$182 per credit (out-of-state resident) • Other fees vary by program (books, supplies, materials, tools, uniforms, health-related exams, etc.) 	<p>Special Note</p> <p>Students have the opportunity to take the challenge exam offered prior to the start of the semester to test out of :</p> <ul style="list-style-type: none"> • Machine Tool Drills • Machine Tool Lathes I • Machine Tool Measuring • Machine Tool Mills I • Machine Tool Saws <p>Functional Abilities</p> <p>Functional abilities are the basic duties that a student must be able to perform with or without reasonable accommodations. At the postsecondary level, students must meet these requirements, and they cannot be modified. Please see program website for specific functional abilities.</p> <p>Entrance Assessment Scores</p> <table border="1"> <thead> <tr> <th>Accuplacer</th> <th>ACT</th> </tr> </thead> <tbody> <tr> <td>Arithmetic - 79</td> <td>Mathematics - 18</td> </tr> <tr> <td>Reading - 55</td> <td>Reading - 18</td> </tr> <tr> <td>Sentence Skills - 60</td> <td>English - 18</td> </tr> </tbody> </table>	Accuplacer	ACT	Arithmetic - 79	Mathematics - 18	Reading - 55	Reading - 18	Sentence Skills - 60	English - 18
Accuplacer	ACT											
Arithmetic - 79	Mathematics - 18											
Reading - 55	Reading - 18											
Sentence Skills - 60	English - 18											
10420120	Machine Tool CAM	2.00										
31420310	Machine Tool Hand Tools	1.00										
31420330	Machine Tool Measuring	1.00										
31420334	Machine Tool Saws	1.00										
31420336	Machine Tool Drills	1.00										
31420340	Machine Tool Lathes I	2.00										
31420350	Machine Tool Mills I	2.00										
31420352	Machine Tool Mills II	2.00										
31420372	Machine Tool Metallurgy	1.00										
31457320	Machine Tool Math	3.00										
31457385	Machine Tool Print Reading	2.00										
31809362	Psychology for Life	1.00										
	Total	19.00										
Term 2												
10420140	Machine Tool EDM I	2.00										
10420142	Machine Tool EDM II	2.00										
10420184	Machine Tool CNC Programming	2.00										
31420342	Machine Tool Lathes II	2.00										
31420360	Machine Tool Grinders	1.00										
31420380	Machine Tool CNC Turning Center	2.00										
31420382	Machine Tool CNC Machining Center	2.00										
31420398	Machine Tool Technical Skills Portfolio	1.00										
31457386	Machine Tool Print Reading Advanced	1.00										
31801359	Communication Skills for the Workplace	2.00										
	Total	17.00										
	Program Total	36.00										
Note:	<p>Course start dates vary; check with your counselor for details.</p> <p>Curriculum and program acceptance requirements are subject to change.</p>											

10420120 Machine Tool CAM

...provides the learner with skills to: explore "Mastercam" computer software environment, construct 2-D geometry, modify existing geometry, create 2-D toolpaths for hole producing, profiling and pocketing, modify toolpaths using operations manager, transform existing toolpaths and create CNC Machine Operator documents.

10420140 Machine Tool EDM 1

...prepares the student to analyze basic Electrical Discharge Machining (EDM) theory, select electrode material, fabricate an electrode, follow sinker EDM safety rules, categorize EDM machine components, set up a sinker EDM, operate a sinker EDM, and create a hand-finished surface.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement and 31420352 Machine Tool Mills 2

10420142 Machine Tool EDM 2

...prepares the learner to analyze wire EDM processes, identify wire EDM components, follow wire EDM safety rules, set up wire EDM machine tools, operate wire EDM machine tool, hand-finish wire EDM surfaces, manual programming wire EDM machine tools and programming wire EDM machine tools using Master CAM Wire.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement and 31420382 Machine Tool CNC Programming and 10420120 Machine Tool CAM

10420184 Machine Tool CNC Programming

...prepares the learner to interpret positions in coordinate systems, prepare a sequence of machining operations, use G&M programming codes, and prepare G&M part programs for machining centers and turning centers.

31420310 Machine Tool Hand Tools

...prepares the learner to identify common hand tools and their usage, identify fastener types including English and metric, and the different grades, assembly procedures and their uses.

COREQUISITES: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

31420330 Machine Tool Measuring

...prepares the learner to use precision measuring instruments and measurement techniques, use comparison measuring instruments and measurement techniques, and perform layout processes.

31420334 Machine Tool Saws

...prepares the learner to follow cutoff machine tool safety rules and operate horizontal cutoff machine tools and vertical cutoff machine tools.

COREQUISITE: 31420330 Machine Tool Measuring and 31420390 Industrial Maintenance Measurement

31420336 Machine Tool Drills

...prepares the learner to follow drilling machine tool safety rules, identify drilling machine tool components, and operate sensitive drilling machine tools and radial drilling machine tools.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

31420340 Machine Tool Lathes 1

...prepares the student to identify the characteristics and attributes of Turning Tools: Follow engine lathe safety rules, identify engine lathe components, perform facing and center drilling operations, perform turning operations, perform lathe operations using collets and perform radius and profile operations.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

31420342 Machine Tool Lathes 2

...prepares the learner to perform hole producing operation in a lathe, perform cutoff operations, perform threading operations and perform turning operations using soft jaws.

COREQUISITE: 31420340 Machine Tool Lathes 1 or successful completion of Lathes Hands-on exam.

31420350 Machine Tool Mills 1

...provides the learner with the skills to: Apply safety rules, Identify machine components, Select cutting tools, Set up the milling machine for work, Mill square surfaces, Mill precision steps and slots, Mill Keyseats on a shafts, and Machine holes on rectangular parts.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

31420352 Machine Tool Mills 2

...prepares the learner to select cutting tools, setup, program and operate Proto-Trak vertical mills. Operations to include: face mill, mill slots, pockets, angles and position drill and program and operate the Proto-Trak using the DXF converter.

COREQUISITE: 31420350 Machine Tool Mills 1 or successful completion of the Mills hands-on exam

31420360 Machine Tool Grinders

...prepares the learner to follow grinding machine tool safety rules, identify grinding machine tool components, grinding wheels, and operate horizontal spindle reciprocating table surface grinders.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement and 31420350 Machine Tool Mills 1 and 31420352 Machine Tool Mills 2

31420372 Machine Tool Metallurgy

...prepares the learner to interpret the properties of ferrous materials, heat treat ferrous material, test the hardness of ferrous materials, and interpret the properties of non-ferrous materials.

31420380 Machine Tool CNC Turning Center

...prepares the learner to follow computer numerical control (CNC) turning machine tool safety rules, identify components, set up and operate a CNC turning machine tool with Fanuc controls, and set up and operate a CNC turning machine tool with Mazatrol control.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement or 31420394 Industrial Maintenance Measurement and Drills

31420382 Machine Tool CNC Machining Center

...prepares the learner to follow Computer Numerical Control (CNC) machining center machine tool safety rules, identify components, set-up, and operate a CNC machining center machine tool with Fanuc controls, and set up and operate a CNC machining center machine tool with Mazatrol controls.

COREQUISITE: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement or 31420394 Industrial Maintenance Measurement and Drills

31420398 Machine Tool Technical Skills Portfolio

...prepares the learner to create a capstone project using multiple machines and setups, create geometry and toolpaths on Mastercam, create a portfolio showing skills attained throughout Machine Tool courses, resume, and grade sheet for all Machine Tool Courses.

COREQUISITES: 31420342 Machine Tool Lathes 2 and 31420350 Machine Tool Mills 1 and 10420120 Machine Tool CAM

31457320 Machine Tool Math

...prepares the learner with the necessary skills to use scientific calculators for the application of pre-algebra, algebra, geometry, and trigonometry. The course is self-paced and designed for individualized student needs, and consists of three credits which can be taken in one-credit increments (basic, intermediate, advanced). Please refer to the class listing for specific one-credit class offerings.

31457385 Machine Tool Print Reading

...prepares the learner to read prints; make isometric sketches; interpret orthographic projection drawings to include sections, auxiliary views, threads, fasteners, surface finishes, geometric dimensions, tolerancing, and assembly prints. The course is self-paced and designed for individualized student needs and may be taken in two one-credit increments. Please refer to the class listing for specific one-credit class offerings.

31457386 Machine Tool Print Reading Advanced

...enhances the learner's ability to read complex drawings, apply geometric dimensioning, and solve problems related to the metal trades. The course is self-paced and designed for individualized student needs.

31801359 Communication Skills for the Workplace

...prepares the student to develop paper job-search tools and job-related writing skills to increase job stability; introduces the students to team-building skills to resolve organizational problems; introduces the student to the skills of effective listening; prepares the student to respond to workplace criticism and praise; and introduces the student to interpersonal relationship skills, including effective interviewing skills, customer relations, and management/employee relations.

31809362 Psychology for Life

...prepares the learner to select behavior modification techniques, demonstrate techniques for enhancing memory, analyze expressions of emotion, use conflict for common good, employ techniques to reduce conflict/frustration, use several methods to reduce stress, interpret personality types, ascertain contributors to perception, and apply methods of problem-solving.