



## COURSE OUTLINE: MAC206 - CYLINDRICAL GRINDING

Prepared: Peter Corbett

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	MAC206: CYLINDRICAL DRAWING TECHNOLOGY
<b>Program Number: Name</b>	6346: GENERAL MACHINIST L2
<b>Department:</b>	MECHANICAL TECHNIQUES PS
<b>Semesters/Terms:</b>	21W, 21F, 22W
<b>Course Description:</b>	This course is designed to provide Level II General Machinist Apprentices the ability to cylindrical grind: external parallels, external tapers, profiles, and plunge grinding.
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	1
<b>Total Hours:</b>	24
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Course Evaluation:</b>	Passing Grade: 50%, D  A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	Other Course Evaluation Requirements: Smart watches, smart phones and similar devices are not allowed during tests or quizzes and must be removed.  Grade Definition Grade Point Equivalent A+ 90 - 100% 4.00 A 80 - 89% B 70 - 79% 3.00 C 60 - 69% 2.00 D 50 - 59% 1.00 F (Fail) 49% and below 0.00 CR (Credit) Credit for diploma requirements has been awarded. S Satisfactory achievement in field /clinical placement or non-graded subject area. U Unsatisfactory achievement in field/clinical placement or non-graded subject area. X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course. NR Grade not reported to Registrar's office. W Student has withdrawn from the course without academic penalty.
<b>Books and Required Resources:</b>	Technology Of Machine Tools by Steve F. Krar, Arthur R. Gill, Peter Smid, Robert J. Gerritsen Publisher: McGraw - Hill Edition: 8 ISBN: 9781260565782

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554

**Course Outcomes and Learning Objectives:**

<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
1. Describe safe working procedures when setting up and operating grinders.	<p>1.1 Identify potential safety hazards which may occur during a grinder set-up and operating procedures. Describe safe working habits including:</p> <ul style="list-style-type: none"> <li>- protective clothing</li> <li>- protective equipment and gear</li> <li>- good housekeeping</li> <li>- start up procedures</li> <li>- shut off procedures</li> <li>- securing workpiece</li> <li>- stabilizing of workpiece</li> <li>- guards and dust extraction system</li> <li>- dressing grinding wheel</li> <li>- inspection of grinding wheel</li> <li>- lock out procedures</li> <li>- maximum wheel rpm</li> <li>- ring test of wheel</li> <li>- lock-out procedures</li> <li>- tagging procedures</li> </ul>
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
2. Set up cylindrical grinder machine controls and coolants. (3 hrs)	<p>2.1 Describe parts of cylindrical grinder:</p> <ul style="list-style-type: none"> <li>- in-feed control</li> <li>- table</li> <li>- bed ways</li> <li>- base</li> <li>- wheel head</li> <li>- table traverse mechanism</li> <li>- trip dogs</li> <li>- saddle</li> <li>- footstock</li> <li>- swivel table adjustment</li> <li>- work head</li> </ul> <p>Set up cylindrical grinder controls:</p> <ul style="list-style-type: none"> <li>- main switch</li> <li>- stop-start switch</li> <li>- table traverse</li> <li>- in-feed selection</li> <li>- cross-feed</li> <li>- wheel feed</li> <li>- cutting fluid</li> <li>- table dwell</li> <li>- work head speed</li> </ul> <p>Set up external grinder controls by determining:</p> <ul style="list-style-type: none"> <li>- work head speeds</li> <li>- feeds</li> <li>- grinder controls/switches</li> </ul>

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554

		<ul style="list-style-type: none"> <li>- table travel motions</li> </ul> <p>Describe cutting fluids including:</p> <ul style="list-style-type: none"> <li>- soluble oils</li> <li>- synthetics</li> <li>- semi-synthetics</li> </ul>
	<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
	3. Set up cylindrical grinder work holding devices, accessories, and attachments.(3 hrs)	<p>3.1 Identify cylindrical grinder work holding devices, accessories, and attachments:</p> <ul style="list-style-type: none"> <li>- centres</li> <li>- steady rest</li> <li>- centre rest</li> <li>- back rest</li> <li>- footstock</li> <li>- magnetic chuck</li> <li>- mandrels</li> <li>- arbors</li> <li>- radius wheel dresser</li> <li>- tangent wheel dresser</li> <li>- wheel dressing attachment</li> <li>- crush roll forming attachment</li> </ul> <p>Set up cylindrical grinder work holding devices, accessories, and attachments by determining:</p> <ul style="list-style-type: none"> <li>- type</li> <li>- size</li> <li>- function</li> <li>- workpiece characteristics</li> <li>- holding characteristics</li> <li>- mounting characteristics</li> <li>- type of wheel</li> <li>- handling</li> <li>-storing</li> <li>- maintenance</li> </ul> <p>Demonstrate contact surface cleaning procedures.</p> <p>Describe magnetizing procedures for permanent and/or electro magnetic chucks.</p> <p>Describe procedures for demagnetizing the work piece.</p> <p>Demonstrate mounting, positioning, aligning, and securing procedures.</p>
	<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
	4.Describe mounting, truing, and dressing of grinding wheels. (3 hrs)	<p>4.1 Demonstrate dressing of grinding wheel.</p> <p>Describe mounting, truing, and balancing of wheel.</p>

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554

		Describe dressing for side grinder/form grinding. Describe radius tangent wheel dresser.												
	<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>												
	5. Develop a plan for cylindrical grinding. (3 hrs)	5.1 Select cylindrical grinding procedures:  - plunge - crush roll forming - profile - parallel/traverse - external taper  Select grinder work holding devices and accessories.  Select cylindrical grinder.  Describe measuring and checking techniques.												
	<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>												
	6.Perform cylindrical grinding. (11 hrs)	6.1 Demonstrate external parallel grinding.  Demonstrate external taper grinding.  Demonstrate cylindrical grinding of profiles.  Demonstrate plunge grinding.												
	<b>Course Outcome 7</b>	<b>Learning Objectives for Course Outcome 7</b>												
	7.Describe routine maintenance. (1 hr)	7.1 Describe routine maintenance and cleaning procedures.  Describe lubrication procedures.  Describe dismantling, handling, and storage of tools, tooling, and measuring equipment.												
<b>Evaluation Process and Grading System:</b>	<table><tr><th>Evaluation Type</th><th>Evaluation Weight</th></tr><tr><td>Attendance, Participation and Attitude</td><td>5%</td></tr><tr><td>Final Test and Practical Project</td><td>50%</td></tr><tr><td>Mid term</td><td>25%</td></tr><tr><td>Quiz 1</td><td>10%</td></tr><tr><td>Quiz 2</td><td>10%</td></tr></table>		Evaluation Type	Evaluation Weight	Attendance, Participation and Attitude	5%	Final Test and Practical Project	50%	Mid term	25%	Quiz 1	10%	Quiz 2	10%
Evaluation Type	Evaluation Weight													
Attendance, Participation and Attitude	5%													
Final Test and Practical Project	50%													
Mid term	25%													
Quiz 1	10%													
Quiz 2	10%													
<b>Date:</b>	January 3, 2021													
<b>Addendum:</b>	Please refer to the course outline addendum on the Learning Management System for further information.													

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554