

COURSE OUTLINE: AMF104 - C.N.C. MACHINING I

Prepared: Peter Corbett

Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	AMF104: COMPUTER NUMERICAL CONTROL MACHINING I		
Program Number: Name	4069: AUTOMATED MANUFACT.		
Department:	ROBOTICS GRADUATE CERTIFICATE		
Semesters/Terms:	21F		
Course Description:	This course is designed to provide students with the importance of Computer numerical control machines in a manufacturing environment. Students will combine classroom knowledge and apply what has been learned on actual CNC Lathes. Students will work in both conversational and normal G code programming to write programs and perform edits as required. Safety in the Shop and the equipment will be strictly followed.		
Total Credits:	5		
Hours/Week:	5		
Total Hours:	75		
Prerequisites:	There are no pre-requisites for this course.		
Corequisites:	There are no co-requisites for this course.		
This course is a pre-requisite for:	AMF204, AMF205		
Vocational Learning Outcomes (VLO's) addressed in this course:	4069 - AUTOMATED MANUFACT.		
	VLO 1 Solve automated manufacturing problems found in a typical industrial environment by applying engineering principles and decision-making strategies.		
Please refer to program web page for a complete listing of program outcomes where applicable.	VLO 3 Select and manage appropriate hardware and software for the creation of engineering designs.		
	VLO 4 Identify and utilize manufacturing processes, rapid prototyping methods, and automation technologies to optimize product development.		
	VLO 5 Incorporate sustainable, economic, safe and ethical approaches in the design and implementation of projects.		
	VLO 7 Exercise professionalism, leadership, and effective communication in an industrial work setting to increase overall productivity and support a positive work environment.		
	VLO 8 Ensure automation equipment is in compliance with established operating procedures, and occupational health and safety regulations.		
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.		
	EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.		
	EES 3 Execute mathematical operations accurately.		
	EES 4 Apply a systematic approach to solve problems.		

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 2021-2022 academic year.



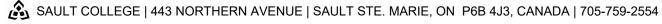
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		thinking skills to anticipate and solve problems. or the diverse opinions, values, belief systems, and contributions of		
	EES 10 Manage the use of time and other resources to complete projects.			
	-	ility for ones own actions, decisions, and consequences.		
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.			
Other Course Evaluation & Assessment Requirements:	Smart watches, smart phones and similar devices are not allowed during tests or quizzes and must be removed.			
	Grade			
Books and Required Resources:	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. CNC Manufacturing Technology by Rick Calverly Publisher: The Goodheart-Wilcox Company Inc. Edition: First ISBN: 978-1-63563-883-7			
Course Outcomes and Learning Objectives:	Course Outcome 1	Learning Objectives for Course Outcome 1		
	Demonstrate safe			
	working practices in a sho	• • •		
	atmosphere in regards to personal and machine safety including work setups.	1.2 Identify various lathe operations and setups required and how to perform safely.		
	Course Outcome 2	Learning Objectives for Course Outcome 2		
	2. Explain the evolution of	f 2.1 List the various types of CNC Machines and their origins.		
	Computer Numerical Controlled machines.	2.2 Identify the components of a CNC lathe.		
		2.3 Understand and explain the Cartesian coordinate system and the right-hand rule for axis identification		

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Course Outcome 3	Learning Objectives for Course Outcome 3	
3. Explain the limitations of a CNC lathe in regards to	3.1 Identify the various operations that can be performed on a CNC lathe.	
manufacturing.	3.2 Identify work holding methods	
	3.3 Identify specific tools used to perform specific operations.	
	3.4 Identify order of operations needed to manufacture a part.	
Course Outcome 4	Learning Objectives for Course Outcome 4	
4. Identify the materials being used.	4.1 Determine the best material selection to perform part manufacture.	
	4.2 Describe the characteristics of the material	
	4.3 Identify alternate materials that could be used and why.	
Course Outcome 5	Learning Objectives for Course Outcome 5	
5. Perform selection of cutting tools to perform various operations.	5.1 Identify the various tooling and how they are designed to cut.	
	5.2 Describe the purpose of the insert on the tool.	
	5.3 Identify the correct setup of the tool to perform the required operation.	
Course Outcome 6	Learning Objectives for Course Outcome 6	
6. Perform operation of the Tormach Path Pilot	6.1 Perform initial startup and orientation of lathe.	
controller.	6.2 Perform basic programming functions in conversational.	
	6.3 Select proper tooling and orientation in the controller.	
	6.4 Understand tool setup in relation to axis and start points.	
	6.5 Perform manual movements to set tool locations.	
	6.6 Understand offsets and how they relate to the tool.	

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments & Labs	25%
Attendance, Attitude and Participation	10%
Lab Practical Test	20%
Written Test #1	15%
Written Test #2	15%
Written Test #3	15%

Date:

July 30, 2021

Addendum:

Please refer to the course outline addendum on the Learning Management System for further

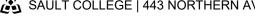
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