UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 2019
REVISED COURSE IMPLEMENTATION DATE: September 2024
COURSE TO BE REVIEWED (six years after UEC approval)**:** February 2025
Course outline form version: 28/10/2022

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: DMFG 205	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Computer Numerical Controlled Machinery **Course Short Title:** CNC Machinery	
Faculty: Faculty of Applied and Technical Studies	**Department (or program if no department):** Digital Manufacturing

Calendar Description:

Computer numerical control theory and operation. CNC Machine operation safety. Computer-Aided Manufacturing principles including tooling, tool path and errors. Machine coding and instruction such as G-code, and pre- and post-processing such as Minkowski geometry. Machining methods and processes.

Prerequisites (or NONE):	ELTR 190.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	30
Supervised laboratory hours (science lab)	30
Total hours	**60**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☐ No ☒ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **Face-to-face only**

Expected frequency: **Fall only**

Maximum enrolment (for information only)**: 20**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See **bctransferguide.ca**.)*

Transfer credit already exists: **No**

Submit outline for (re)articulation: **No**
(If yes, fill in transfer credit form.)

Department approval	**Date of approval:**	October 27, 2023
Faculty Council approval	**Date of meeting:**	December 2023
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	March 1, 2024

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Explain the structure of a CNC machine and similar equipment.
2. Program and operate CNC machines.
3. Analyze and interpret engineering drawings.
4. Identify the software application best suited to select machines, tools, and accessories.
5. Integrate principles and practices required to manufacture components.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Assignments:	50%	Lab work:	50%		%
	%		%		%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.)*

Lectures and Lab work with occasional guest lecture

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.		No textbook required – internal worksheets and lecture notes will be provided		
2.				
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Students will require a tablet-type device suitable for design collaboration and curation.

Course Content and Topics

Unit 1: CNC physical architecture
Unit 2: The CNC controller
Unit 3: Application software
Unit 4: Building or buying a CNC machine
Unit 5: Part program development
Unit 6: Calculating contour points
Unit 7: Using cutter radius offset
Unit 8: Part reversal in milling
Unit 9: Special purpose g-codes
Unit 10: Tool length offset change
Unit 11: Standard and rigid tapping
Unit 12: Polar coordinates
Unit 13: Techniques for grooving
Unit 14: Techniques for threading
Unit 15: Practical thread milling
Unit 16: Four-axis lathes
Unit 17: Knurling on CNC lathes
Unit 18: Working with planes
Unit 19: Programming cams