ORIGINAL COURSE IMPLEMENTATION DATE: September 2019

REVISED COURSE IMPLEMENTATION DATE:

COURSE TO BE REVIEWED (six years after UEC approval)**:** February 2025

Course outline form version: 05/18/2018

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:

(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)

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):	Admission to the Digital Manufacturing diploma or department permission.
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:

Dual-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 hours	30
Tutorials/workshops	
Supervised laboratory hours	30
Experiential (field experience, practicum, internship, etc.)	
Supervised online activities	
Other contact hours:	
Total hours	**60**

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

Special Topics *(Double-click on boxes to select.)*

This course is offered with different topics:

☒ No ☐ Yes *(If yes, topic will be recorded when offered.)*

Independent Study

If offered as an Independent Study course, this course may be repeated for further credit: *(If yes, topic will be recorded.)*

☐ No ☐ Yes, repeat(s) ☐ Yes, no limit

Transfer Credit

Transfer credit already exists: *(See bctransferguide.ca.)*

☒ No ☐ Yes

Submit outline for (re)articulation:

☒ No ☐ Yes *(If yes, fill in transfer credit form.)*

Grading System

☒ Letter Grades ☐ Credit/No Credit

Maximum enrolment (for information only): 20

Expected Frequency of Course Offerings:

Annually *(Every semester, Fall only, annually, etc.)*

Department / Program Head or Director:	**Date approved:**	October 2018
Faculty Council approval	**Date approved:**	November 8, 2018
Dean/Associate VP: John English	**Date approved:**	November 8, 2018
Campus-Wide Consultation (CWC)	**Date of posting:**	January 18, 2019
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	February 1, 2019

Learning Outcomes:

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

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

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.)*

Lectures and Lab work with occasional guest lecture

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

Typical Text(s) and Resource Materials *(If more space is required, download Supplemental Texts and Resource Materials form.)*

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	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.

Typical Evaluation Methods and Weighting

Final exam:	%	Assignments:	50%	Field experience:	%	Portfolio:	%
Midterm exam:	%	Project:	%	Practicum:	%	Other:	%
Quizzes/tests:	%	Lab work:	50%	Shop work:	%	Total:	100%

Details (if necessary):

Typical 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