A POLYTECHNIC INSTITUTION

School of Manufacturing, Electronics and Industrial Processes

Program: Technology Teacher Education
Option: Diploma

Course Outline

TTED 4036
Computer Control 2 for TTED

Start Date:	September, 2006				**End Date:**	November, 2006			
Total Hours:	20	**Total Weeks:**	10		**Term/Level:**	3	**Course Credits:**	1.5	
Hours/Week:	2	**Lecture:**	1	**Lab:** 1	**Shop:**	n/a	**Seminar:**	n/a	**Other:** n/a

Prerequisites

Course No.	Course Name
TTED 4000	Design, Drawing & CAD 1
TTED 4010	Computer Applications for TTED
TTED 4025	Product Manufacturing for TTED
TTED 4035	Computer Control 1 for TTED
TTED 4040	Materials Science for TTED

TTED 4036 is a Prerequisite for:

Course No.	Course Name
TTED 5000	Teaching Design, Draw & CAD/CAM
TTED 5xxx	All other 5000 level TTED courses.

v Course Description

Introduces Computer Aided Manufacturing (CAM) software to produce part geometry, toolpaths, and G-code programs to manufacture artifacts on a CNC machine. Includes design of products and application of fixtures suitable for the technology education classroom. Appropriate safety equipment is required for all shop-based activities.

v Detailed Course Description

This goals of the course are to prepare students to use Computer Aided Manufacturing (CAM) software to create part geometry and assign appropriate tool paths, generate CNC programs with a post processor, and provide students with the knowledge and experience necessary to enable them to safely and effectively use CNC equipment typically available in secondary school technology education classrooms.

v Evaluation

Course evaluation will be based on assignments, periodic quizzes and a final exam. The approximate weighting of evaluation is shown below, but is subject to adjustment.

Labs and/or activities	30
Quizzes (written & on computer)	40
Final Exam	30
TOTAL	100%

Comments: The passing grade in the theory and practical aspects of this course is 50%. Should a student not achieve a passing grade in both the theory and practical components of this course an unsatisfactory standing will be issued and the course failed.

A student who does not consistently work in the prescribed safe manner may have lab privileges withdrawn and therefore be unable to complete this course.

v Course Learning Outcomes/Competencies

Upon successful completion, the student will be able to:

1. Explain the advantages of using CAM software
2. Demonstrate the ability to produce 2-D geometry using CAM software
3. Demonstrate the ability to generate G-Code programs using the Post Processor
4. Describe an Operation Plan to manufacture a part on a CNC machine
5. Describe the initial setup of a CNC machine
6. Produce a product on a CNC machine with a program they have created

v Verification

I verify that the content of this course outline is current.

Authoring Instructor — 28/8/06 Date

I verify that this course outline has been reviewed.

Program Head/Chief Instructor — 28/08/06. Date

I verify that this course outline complies with BCIT policy.

Dean/Associate Dean — 2006/08/28 Date

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

v Instructor(s)

Ian Mathie

Office Location: SW9 – 201K
Office Hrs.: By Appointment or as posted

Office Phone: 604 - 432 - 8541
E-mail Address: Ian_Mathie@bcit.ca

v Learning Resources

Required:

- 3 ½" 1.44 Meg. Floppy diskettes, 3-ring binder

Recommended:

- Personal computer system including inkjet or laser printer.

v Information for Students

Assignments: Late assignments, lab reports or projects will be devalued 10% per day late. Assignments must be done on an individual basis unless otherwise specified by the instructor.

Note: Please refer to BCIT policy number 5002, Student Regulations Policy, for additional information. Policies are available at http://www.bcit.ca/about/administration/policies.shtml.

Ethics: BCIT assumes that all students attending the institute will follow a high standard of ethics. Incidents of cheating or plagiarism may, therefore, result in a grade of zero for the assignment, quiz, test, exam or project for all parties involved and/or expulsion from the course.

Assignments: Assignments, lab reports or projects must be done on an individual basis unless otherwise specified by the instructor. Late assignments, lab reports or projects will be devalued 10% per day late to a maximum of 3 days late.

Makeup Tests, Exams or Quizzes: There will be **no** makeup tests, exams or quizzes. If you miss a test, exam or quiz, you will receive zero marks. Exceptions may be made for **documented** medical reasons or extenuating circumstances. In such a case, it is the responsibility of the student to inform the instructor **immediately**.

Attendance: The attendance policy as outlined in BCIT Policy 5002 will be enforced. Attendance will be taken at the beginning of each session. Students not present at that time will be recorded as absent.

Illness: If you miss an evaluation such as an assignment, quiz, exam, or project, or you miss 3 or more consecutive days of class, you must provide the department with a BCIT Student Medical Certificate (available at http://www.bcit.ca/admission/downloads.shtml). You may be asked to complete the work that you missed or the course evaluation may be adjusted to reflect the missed component(s).

Attempts: Students must successfully complete a course within a maximum of three attempts. Students with two attempts in a single course must get written permission from the Associate Dean to attempt the course for the third time. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the program.

Advancement: Students who fail three or more courses in a term cannot advance to the next term and may be asked to discontinue from the program.

Course Outline Changes: The material or schedule specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class.

v Assignment Details

There will be several exercises assigned to provide practice and experience in the concepts presented. These exercises will not be graded, however they should be completed before the start of the next lab session to ensure student experience with that feature and to provide time for the student to seek further instruction or assistance if required.

Assignments which do not meet the standards expected in this program will be returned unmarked.

Schedule

Note: This schedule is provided as an overview only and is subject to revision

Week	Lecture Topic	Lab Assignment	Reference/ Reading	Assignment	Due Date
1	Labour Day Holiday	No Classes	-	-	-
2	Course Introduction CAM overview CNC Lathe	Mastercam Introduction	Course Outline CNC Lathe	Mastercam -introduction lab	Lab completed by next class
3	CNC Router Activity CNC Lathe Activity Xform & Modify CNC Lathe programming	Xform lab Modify lab CNC Lathe orientation	CNC lathe	Router Act. Mindmap CNC Lathe Ideation Xform & Modify lab	Lab completed by next class Mindmap & Ideation due Week 4
4	Text for machining CNC Lathe programming	Mastercam tutorial 1 Lettering lab CNC Lathe orientation	Lab CNC lathe	Mcam Tutorial 1 Lettering Lab Router Act. ideation CNC Lathe geometry	Tutorial & lab completed by next class
5	Raster to Vector conversion CNC Lathe programming	Rast2Vec lab CNC Lathe orientation	Lab CNC lathe	Rast2Vec lab Router Act. geometry CNC Lathe program	Lab completed by next class
6	Thanksgiving Holiday	No classes	CNC lathe	CNC Lathe program	-
7	Midterm Quiz (geometry)	Midterm Quiz (geometry) CNC Lathe Activity	CNC lathe	Router Act. geometry CNC Lathe program	-
8	Toolpaths & Toolpath parameters	Chaining lab, Job Setup lab Operations Manager lab CNC Lathe Activity	Lab	Chaining, Job Setup & Operations Manager labs Router Act. toolpaths	Labs completed by next class
9	Post Processing	Using the Post Processor lab CNC Lathe Activity	Lab	Mcam Tutorial 2 Router Act. toolpaths	Tutorial completed by next class
10	Review	Lab & activity wrap-up CNC Lathe Activity	Review all handouts & labs	Complete Activities & Labs	-
11	Final Exam	Final Exam	-	-	Both Activities due