North Central Michigan College
Master Course Syllabus

PART 1:

Course Name: CNC Lathe Spindle Speed and Feed Rates

Course Number: CNC 122

Credit Hrs. 1   Lecture Hrs. 0   Lab Hrs. 0   Clinical Hrs. 0   Variable Hrs.0

Total Hours of Instruction: 1   Total Contact Hours: 17.6
(Total Contact hour's formula: (lecture hrs. + lab hrs. + clinical hrs) x 17.6)

Course Description:
Learn how work holding, material, and cutting tools change the spindle speed and feed rates during operation. Exercise cutter compensation for custom tools to perform accurately in the CNC lathe. Determine best results during operation for spindle speeds and feed rates and report to the programmer/instructor what was successful in each setup and any problems that occurred during operation.

Prerequisite (s): CNC 112
Co-requisite (s): None

Course Objectives:
Appropriate to third in sequence.

- Comprehend process control and planning.
- Analyze print for machining and part inspection.
- Identify and Demonstrate Usage of Machine Safety and Personal Protective Equipment.
- Setup a CNC lathe for manufacturing processes involved in part production and verify G-code program using CNC mill.
- Demonstrate CNC lathe machine controls (load tools and tool holders, select correct work offset, select, activate, proof, delete programs, and power down equipment safely).
- Demonstrate use of cutter compensation to accurately machine a part to compensate custom tooling.
- Manufacture and present a plastic part and an aluminum part within .005" of the manufacturing specifications.

Reasonable accommodations can be provided for students with documented disabilities. Please contact Learning Support Services to arrange for these (231)348-6687 or (231)348-6817, Room 533 SCRC.

North Central Michigan College Master Course Syllabus

Lumina DQP outcomes and linked course objectives
(Please identify all Lumina DQP outcomes supported by this course, including the complete language of each outcome as shown on Part 3 of this syllabus. Under each Lumina DQP outcome, please list any course objectives that support the prior DQP outcome.)

Lumina DQP Outcome 2: Illustrates contemporary terminology used in the field.
- Comprehend process control and planning.
- Identify and Demonstrate Usage of Machine Safety and Personal Protective Equipment.

Lumina DQP Outcome 3: Generates substantially error-free products, reconstructions, data, juried exhibits or performances as appropriate to the field.
- Demonstrate CNC lathe machine controls (load tools and tool holders, select correct work offset, select, activate, proof, delete programs, and power down equipment safely).
- Demonstrate use of cutter compensation to accurately machine a part to compensate custom tooling.
- Manufacture and present a plastic part and an aluminum part within .005" of the manufacturing specifications.

Lumina DQP Outcome 6: Illustrates core concepts of the field while executing analytical, practical or creative tasks.
- Comprehend process control and planning.
- Analyze print for machining and part inspection.
- Identify and Demonstrate Usage of Machine Safety and Personal Protective Equipment.

Lumina DQP Outcome 13: Presents accurate calculations and symbolic operations, and explains how such calculations and operations are used in either his or her specific field of study or in interpreting social and economic trends.
- Identify and Demonstrate Usage of Machine Safety and Personal Protective Equipment.
- Setup a CNC lathe for manufacturing processes involved in part production and verify G-code program using CNC mill.

Suggested Methods of Instruction:
Lecture, small-group discussion, PowerPoint presentations, video demonstrations, and hands-on lab sessions, using laptop computers and CNC lathe.

Suggested Methods of Assessment and Evaluation:
Quizzes, exams, successful production of basic part using CNC software.

Adopted Text at Time of Course Adoption/Revision:
Gizelback, Richard A. CNC Machining Fundamentals and Applications.

Topics Covered During the Semester:
Sequence of topics and time allowance are at the discretion of the instructor

Week 1	Introduction to CNC Programming Course Expectations
Week 2	Safe Work Habits
	Equipment Identification
Week 3	Reading Prints/Measuring Equipment
Week 4	Creating Geometry
	Working with CAM software
Week 5	Review Shop Math applied to
	Start part project 1
	Group Lab Stations with CNC lathe
Week 6	Review Shop Math applied to
	Continue and finish part project 1
	Group Lab Stations with CNC lathe
Week 7	Review Shop Math applied to
	Start part project 2
	Group Lab Stations with CNC lathe
Week 8	Review Shop Math applied to
	Continue and finish part project 2
	Group Lab Stations with CNC lathe
Week 9	Review Shop Math applied to
	Start part project 3
	Group Lab Stations with CNC lathe
Week 10	Review Shop Math applied to
	Continue and finish part project 3
	Group Lab Stations with CNC lathe
Week 11	Review Shop Math applied to
	Start part project 4
	Group Lab Stations with CNC lathe

Week 12   Review Shop Math applied to
               Continue and finish part project 4
               Group Lab Stations with CNC lathe
Week 13   Review Shop Math applied to
               Start part project final
               Group Lab Stations with CNC lathe
Week 14   Review Shop Math applied to
               Continue part project final
               Group Lab Stations with CNC lathe
Week 15   Review Shop Math applied to
               Continue part project final
               Group Lab Stations with CNC lathe
Week 16   Review and inspect final part project exam

Section 1 & Section 2 approved by CRDAP on: 04 22 14		
Section 2 approved by AD:	Date:	
Section 2 approved by CRDAP Chair:	Date:	

North Central Michigan College Master Course Syllabus

Use this reference sheet in Part 2 of Master Course Syllabus

Specialized Knowledge
1. Describes the scope and principal features of the field of study, citing at least some of its core theories and practices, and offers a similar explication of at least one related field.
2. Illustrates contemporary terminology used in the field.
3. Generates substantially error-free products, reconstructions, data, juried exhibits or performances as appropriate to the field.

Broad Integrative Knowledge
4. Describes how existing knowledge or practice is advanced, tested and revised
5. Describes and examines a range of perspectives on key debates and their significance both within the field and in society.
6. Illustrates core concepts of the field while executing analytical, practical or creative tasks.
7. Selects and applies recognized methods of the field in interpreting characteristic discipline-based problems.
8. Assembles evidence relevant to characteristic problems in the field, describes the significance of the evidence, and uses the evidence in analysis of these problems.
9. Describes the ways in which at least two disciplines define, address and interpret the importance of a contemporary challenge or problem in science, the arts, society, human services, economic life or technology.

Intellectual Skills – Analytic Inquiry
10. Identifies, categorizes and distinguishes among elements of ideas, concepts, theories and/or practical approaches to standard problems.

Intellectual Skills – Use of Information Resources
11. Identifies, categorizes, evaluates and cites multiple information resources necessary to engage in projects, papers or performance in his or her program.

Intellectual Skills – Engaging Diverse Perspectives
12. Describes how knowledge from different cultural perspectives would affect his or her interpretations of prominent problems in politics, society, the arts and/or global relations.

Intellectual Skills – Communication Fluency
13. Presents accurate calculations and symbolic operations, and explains how such calculations and operations are used in either his or her specific field of study or in interpreting social and economic trends.
14. Presents substantially error-free prose in both argumentative and narrative forms to general and specialized audiences.

Applied Learning
15. Describes in writing at least one substantial case in which knowledge and skills acquired in academic settings are applied to a challenge in a non-academic setting; applies that learning to the question; and analyzes at least one significant concept or method related to his or her course of study in light of learning outside the classroom.
16. Locates, gathers and organizes evidence on an assigned research topic addressing a course-related question or a question of practice in a work or community setting; offers and examines competing hypotheses in answering the question.

Civic Learning
17. Describes his or her own civic and cultural background, including its origins and development, assumptions, and predispositions.
18. Describes diverse positions, historical and contemporary, on selected democratic values or practices, and presents his or her own position on a specific problem where one or more of these values or practices are involved.
19. Takes an active role in a community context (work, service, co-curricular activities, etc.), and examines the civic issues encountered and the insights gained from the community experience.

The Degree Qualifications Profile was adopted by CRDAP: April 11, 2012