

Course Discipline Code & No: NCT 112 Title: Introduction to Computerized Machining (CNC) Effective Term Fall ~~Winter 2006~~

Division Code: HAT Department Code: INTD Org #: 14400

Don't publish: ☐ College Catalog ☐ Time Schedule ☐ Web Page

Reason for Submission. Check all that apply.

☐ New course approval ☐ Reactivation of inactive course

☒ Three-year syllabus review/Assessment report ☐ Inactivation (Submit this page only.)

☐ Course change

Change information: Note all changes that are being made. Form applies only to changes noted.

☐ Consultation with all departments affected by this course is required. ☐ Total Contact Hours (total contact hours were: _____)

☐ Course discipline code & number (was _____)* ☐ Distribution of contact hours (contact hours were: _____)

*Must submit inactivation form for previous course. ☒ Pre-requisite, co-requisite, or enrollment restrictions removing rev. II

☐ Course title (was _____) ☐ Change in Grading Method

☐ Course description ☐ Outcomes/Assessment

☒ Course objectives (minor changes) ☐ Objectives/Evaluation

☐ Credit hours (credits were: _____) ☐ Other _____

Rationale for course or course change. Attach course assessment report for existing courses that are being changed.

The assessment component is to be added to this Master Syllabus.

Approvals Department and divisional signatures indicate that all departments affected by the course have been consulted.

Department Review by Chairperson ☐ New resources needed ☐ All relevant departments consulted

Print: Thomas Penird Signature: [Signature] Date: 11/22/05

Faculty/Preparer

Print: Gary Schultz Signature: [Signature] Date: 11/23/05

Department Chair

Division Review by Dean

☐ Request for conditional approval

Recommendation ☒ Yes ☐ No [Signature] 11/23/05

Dean's/Administrator's Signature Date

Curriculum Committee Review

Recommendation ☐ Tabled ☒ Yes ☐ No [Signature] 2/6/06

Curriculum Committee Chair's Signature Date

Vice President for Instruction Approval

[Signature] 2/13/06

Vice President's Signature Date

Approval ☒ Yes ☐ No ☐ Conditional

Do not write in shaded area.

Entered in: Banner 3/7 C&A Database 3/7 Log File 11/23/05 Basic skills spreadsheet updated ☐ Contact fee ☐ WCHS

Please return completed form to the Office of Curriculum & Assessment and email an electronic copy to sjohn@wccnet.edu for posting on the website.

***Complete ALL sections which apply to the course, even if changes are not being made.**

Course: <u>NCT 112</u>	Course title: Title: <u>Introduction to Computerized Machining (CNC)</u>
------------------------	--

Credit hours: <u>4</u> If variable credit, give range: _____ to _____ credits	Contact hours per semester: <table style="width:100%"> <tr> <th></th> <th style="text-align:center"><u>Student</u></th> <th style="text-align:center"><u>Instructor</u></th> </tr> <tr> <td>Lecture:</td> <td style="text-align:center"><u>30</u></td> <td style="text-align:center"><u>30</u></td> </tr> <tr> <td>Lab:</td> <td style="text-align:center"><u>60</u></td> <td style="text-align:center"><u>60</u></td> </tr> <tr> <td>Clinical:</td> <td style="text-align:center">_____</td> <td style="text-align:center">_____</td> </tr> <tr> <td>Practicum:</td> <td style="text-align:center">_____</td> <td style="text-align:center">_____</td> </tr> <tr> <td>Other:</td> <td style="text-align:center">_____</td> <td style="text-align:center">_____</td> </tr> <tr> <td>Totals:</td> <td style="text-align:center"><u>90</u></td> <td style="text-align:center"><u>90</u></td> </tr> </table>		<u>Student</u>	<u>Instructor</u>	Lecture:	<u>30</u>	<u>30</u>	Lab:	<u>60</u>	<u>60</u>	Clinical:	_____	_____	Practicum:	_____	_____	Other:	_____	_____	Totals:	<u>90</u>	<u>90</u>	Are lectures, labs, or clinicals offered as separate sections? ☐ Yes - lectures, labs, or clinicals are offered in separate sections ☒ No - lectures, labs, or clinicals are offered in the same section	Grading options: ☐ P/NP (limited to clinical & practica) ☐ S/U (for courses numbered below 100) ☒ Letter grades
	<u>Student</u>	<u>Instructor</u>																						
Lecture:	<u>30</u>	<u>30</u>																						
Lab:	<u>60</u>	<u>60</u>																						
Clinical:	_____	_____																						
Practicum:	_____	_____																						
Other:	_____	_____																						
Totals:	<u>90</u>	<u>90</u>																						

Prerequisites. Select one:

☒ College-level Reading & Writing

☐ Reduced Reading/Writing Scores

☒ No Basic Skills Prerequisite

(Add information at Level I prerequisite)

(College-level Reading and Writing is not required.)

In addition to Basic Skills in Reading/Writing:

Level I (enforced in Banner)

Course	Grade	Test	Min. Score	Concurrent Enrollment (Can be taken together)	Corequisites (<u>Must</u> be enrolled in this class also during the same semester)
☐ and ☐ or _____	_____	_____	_____	☐	_____
☐ and ☐ or _____	_____	_____	_____	☐	_____
☐ and ☐ or _____	_____	_____	_____	☐	_____
☐ and ☐ or _____	_____	_____	_____	☐	_____

Level II (enforced by instructor on first day of class)

Course	Grade	Test	Min. Score
☐ and ☐ or _____	_____	_____	_____
☐ and ☐ or _____	_____	_____	_____

Enrollment restrictions (In addition to prerequisites, if applicable.)

☐ and ☐ or Consent required

☐ and ☐ or Admission to program required

☐ and ☐ or Other (please specify):

Program: _____

Please send syllabus for transfer evaluation to:

Conditionally approved courses are not sent for evaluation.

Insert course number and title you wish the course to transfer as.

☐ E.M.U. as _____

☐ _____ as _____

☐ U of M as _____

☐ _____ as _____

☐ _____ as _____

☐ _____ as _____

MASTER SYLLABUS

Course NCT 112	Course title Introduction to Computerized Machining (CNC)	
Course description State the purpose and content of the course. Please limit to <u>500</u> characters.	This course develops proficiency in setup and operation of CNC Machining and Turning Centers. Students master CNC machine tool controls through laboratory experiences and the manufacturing of pre-programmed parts. Part holding techniques and alignments are included in the course material. Process planning, tooling for CNC Machine Tools and inspection of machined products are also part of the course.	
Course outcomes List skills and knowledge students will have after taking the course. Assessment method Indicate how student achievement in each outcome will be assessed to determine student achievement for purposes of course improvement.	Outcomes (applicable in all sections)	Assessment Methods for determining course effectiveness
	Students will be able to setup and operate Vertical Machining Centers and Turning Centers. Students will set machine parameters for machine tool operations at multiple work locations. Students will analyze part measurements and derive necessary changes at the machine tool registers to produce parts within specified tolerances.	Department Proficiency Exams (Rubric) Capstone Projects (Rubric) Capstone Projects (Rubric) Department Exams (Problem solving, Matching, Short answer)
Course Objectives Indicate the objectives that support the course outcomes given above. Course Evaluations Indicate how instructors will determine the degree to which each objective is met for each student.	Objectives (applicable in all sections)	Evaluation Methods for determining level of student performance of objectives
	Students will recognize key concepts associated with CNC machining including; scope of numerical control, climb verses conventional milling, differences between CNC turning centers and machining centers, requirements of the CNC setup operator, use of the cartesian coordinate system, Absolute verses incremental positioning, point to point verses continuous path motion, preparatory codes and miscellaneous codes. Students will be able to calculate speeds and feeds associated with cutter and part properties. Work offsets, tool length offsets, tool geometry offsets, cutter diameter compensation and tool wear offsets will be applied at the machine control units. Manufacturing and inspection of parts, at machining centers, turningcenters, and CNC WireEDM to given setup instructions, part drawings, and specification. Identify key preparatory codes, required to locate the beginning and ending components to program modules Identify key miscellaneous codes, required to activate various machine tool conditions within program modules Students will construct simple programs and run the parts at the CNC machine tools Use the seven areas of the machine control unit; function, display, alpha numeric, axis motion, override, cursor-page, and mode buttons.	Quizzes : Matching, Fill in the Blank, Short answer Quizzes; (Solve problems) Capstone projects Capstone projects Quizzes : Matching, Fill in the Blank, Short answer Capstone projects Quizzes : Matching, Fill in the Blank, Short answer Capstone projects Homework exercises Capstone projects

MASTER SYLLABUS

List all new resources needed for course, including library materials.

Student Materials:

List examples of types	Estimated costs
- Texts - Supplemental reading - Supplies - Uniforms - Equipment - Tools - Software	\$

Equipment/Facilities: Check all that apply. (All classrooms have overhead projectors and permanent screens.)

Check level only if the specified equipment is needed for all sections of a course.

- ☐ Level I classroom
Permanent screen & overhead projector
- ☐ Level II classroom
Level I equipment plus TV/VCR
- ☒ Level III classroom
Level II equipment plus data projector, computer, faculty workstation

- ☐ Off-Campus Sites
- ☐ Testing Center
- ☐ Computer workstations/lab
- ☐ ITV
- ☐ TV/VCR
- ☐ Data projector/computer
- ☐ Other _____

MASTER SYLLABUS

Assessment plan:

Learning outcomes to be assessed (list from Page 3)	Assessment tool	When assessment will take place	Course section(s)/other population	Number students to be assessed
Students will be able to setup and operate Vertical Machining Centers and Turning Centers.	Department Proficiency Exams (Rubric)	Winter 2006 Once per three year cycle	All	Random Sampling 15 students
Students will set machine parameters for machine tool operations at multiple work locations.	Capstone Projects	Winter 2006 Once per three year cycle	All	Random Sampling 12 parts from students
Students will analyze part measurements and derive necessary changes at the machine tool registers to produce parts within specified tolerances.	Capstone Projects (Rubric) Department Exams (Written)	Winter 2006 Once per three year cycle	All	Random Sampling 12 parts from students Review problem solving components at the final exam

Scoring and analysis of assessment:

- Indicate how the above assessment(s) will be scored and evaluated (e.g. departmentally developed rubric, external evaluation, other). Attach the rubric.
 - The ability to setup and operate the machine tools will be scored using a hands on proficiency test with a scoring rubric to be conducted at the end of each semester.
 - The data from the rubric will be compiled and shared with the department.
 - The scoring and evaluation for establishing machine tool parameters will be accomplished by evaluating a random sampling of student parts.
 - The analysis of parts measurements and corrections made to obtain good parts will be scored and evaluated by reviewing data and inspection sheets to corresponding parts as well as evaluating results from problem solving component to the final exam.
- Indicate the standard of success to be used for this assessment.
 - 75% of the student population having an average score of 3 or greater on the rubric for the final proficiency
 - 100% of the projects reviewed have an average score of 3 or greater on the rubric
 - 75% of students resolve more than 50% of the changes needed to "fix the part(s)" at problem solving component(s) to the final exam
- Indicate who will score and analyze the data.
 - The department will score and analyze the data
- Explain the process for using assessment data to improve the course.
 - Data from the proficiency exams will identify strength and weaknesses of students ability to set-up and operate the machine tools. Weaknesses will be addressed and curricular changes made where needed
 - Data from the capstone projects will indicate student success at making the necessary adjustments at the controllers to manufacture parts within specification. Weaknesses will be addressed and curricular changes made where needed
 - Data from the written component at the final "problem solving components" will evaluate the students ability to synthesize. Weaknesses will be addressed and curricular changes made where needed.