

**NORTHEASTERN TECHNICAL COLLEGE  
COURSE OUTLINE**

<b>COURSE:</b> MTT	<b>PREFIX NO.</b> 231	<b>EFFECTIVE DATE</b> SPRING 2007	<b>NEXT REVIEW DATE</b> SPRING 2008		
<b>TITLE:</b> TOOL AND DIEMAKING I		<b>CREDITS</b> 5	<b>CONTACTS</b>		
			<b>CLASS</b>	<b>LAB</b>	<b>TOTAL</b>
			2	9	5
<b>PREREQUISITES:</b> MTT 126 AND MTT 211					

**DESCRIPTION:**

This course covers the manufacture and use of a simple blanking or piercing die or tools.

**TEXTBOOK(S) OR ALTERNATIVE:**

Basic Diemaking, D. Eugene Ostergaard

**MATERIALS (specifying those to be purchased by student):**

Safety Glasses

**COLLATERAL READING:**

The Machinist Ready Reference  
Machinery's Handbook 24th Edition

**CLASS MANAGEMENT ACTIVITIES (Attendance, tardies, testing, etc.):**

**Academic Dishonesty:** Students are expected to do their own work. Please refer to the NETC Student Code and Grievance Procedure for a definition of academic dishonesty and an outline of the disciplinary action that may result therefrom.

**Attendance and tardies:** The student is required by the instructor to attend 90% of the classes. Three tardies will constitute one absence.

**Projects:** Appearance and tolerance)

**Disabilities Statement:** Students with disabilities are encouraged to contact the Vice President for Student Services to discuss needs or concerns as they pursue an academic program and participate in campus life. The Vice President for Student Services will provide guidance regarding official documentation of disabilities and/or accommodation of needs. (See College Catalog)

**Student ID:** It is mandatory that every student wear his or her student ID at all times on the Cheraw campus. During the first week of classes, the instructor will issue a reminder to wear the ID. This reminder is a warning.

After the first week of classes, instructors are required to dismiss students without ID from class. The student may get his/her ID (or a new one in Student Services for \$3.00) and return to class before the midpoint of the class. If the student cannot get an ID and return to class by midpoint, the instructor will record the absence.

**RESOURCES (A-V, persons, tools/equipment):**

Visual aid, tool steels, existing dies, die components.  
Reference Books as listed in the learning activities

**COURSE TOPICAL OUTLINE: (List topics and sub-topics of course) and Calendar or approximate length of time devoted to topic.**

Weeks 1-13                      Build die set to print.  
Weeks 14-15                     Run parts, correct errors if possible.

**OBJECTIVES OF COURSE:**

To successfully complete this course the student will be able to demonstrate the theory and practice of precision machining on all toolroom equipment and explain safety and good housekeeping for machine operators.

**INSTRUCTIONAL METHODS TO COMPLETE OBJECTIVES:**

Lecture  
Hands on operation in machine tool lab

**EVALUATIVE METHODS TO APPRAISE OBJECTIVES:**

Grading of piece parts and working die	70% of final grade
Observation of work habits	15% of final grade
Observation of care of machines and tools	15% of final grade

**GRADING:**

100 - 93 = A  
92 - 85 = B  
84 - 77 = C  
76 - 69 = D  
68 -BELOW = F

**TO RECEIVE FINAL GRADE:**

Students must complete their Blanking Dies to receive a grade.  
Students must participate in final lab clean-up or will receive a grade of I. Lab clean-up date will be announced when exam schedule is posted.

**STUDENT PARTICIPATION:** Evaluation of your participation will be based on the following:

- (100 - 80) Comes to class prepared; voluntarily and enthusiastically participates in classroom activities, presentations, and clean-up. Stimulates creativity and demonstrates excellent completion of in-class assignments. Must demonstrate respect to instructor and fellow students.
- (80 - 60) Comes to class prepared; usually participates in classroom activities, presentations, and clean-up. Demonstrates satisfactory completion of in-class assignments. Must have above average attendance, a positive attitude, and demonstrates respect for instructor and fellow students.

- (60 - 40) Usually comes to class prepared; occasionally participates in classroom activities, presentations, and clean-up. Completes most in-class assignments. Has average attendance, a positive attitude, and demonstrates respect for instructor and fellow students.
- (40 - 20) Occasionally comes to class prepared; reluctantly participates in class activities. Occasionally completes in-class assignments. Has below average attendance, uncooperative attitude, and demonstrates lack of respect for instructor and fellow students.
- (20 - 0) Seldom comes to class prepared; uncooperative and disruptive to class discussions or other learning activities. Has poor attendance and shows disrespect for instructor and fellow students. Avoids class clean-up and/or has a negative attitude.

**DUTIES, TASKS, AND PERFORMANCE OBJECTIVES:**

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine Cutting Clearance

**PERFORMANCE OBJECTIVE:**

Student will determine the amount of cutting clearance required for the type of material and die operation being used.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" pp. 3-6

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine Punch and Die Sizes

**PERFORMANCE OBJECTIVE:**

Student will determine the size of the punch and die opening from the piece part dimensions and tolerances.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" p.6

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine The Angular Clearance

**PERFORMANCE OBJECTIVE:**

Student will determine the method of applying angular clearance and the amount of angular clearance required for a die based on the type of operation and type of material being used.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" pp. 6-9

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine Cutting Force

**PERFORMANCE OBJECTIVE:**

Student will determine the tonnage required for a blanking die from the dimensions given on the piece part and the type of material.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" pp. 10-11

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine Stripping Force

**PERFORMANCE OBJECTIVE:**

Student will determine the tonnage required to strip the material from the punch of a blanking die, from the information given on the piece part drawing.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" pp. 11-13

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine Stock Strip Sizes

**PERFORMANCE OBJECTIVE:**

Student will do a stock strip layout for a single pass station blanking die and determine all strip dimensions.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" Chapter 15

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine Gage Sizes

**PERFORMANCE OBJECTIVE:**

Student will determine the sizes of the back gage and front support and the distance between them.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" pp. 17, 179-180 and Chapter 10
2. Read "Die Design Fundamentals" p. 53

**DUTY:** MAKE BLANKING DIE CALCULATIONS

**TASK:** Determine Stop Position

**PERFORMANCE OBJECTIVE:**

Student will determine the head and stock sizes and the location of a headed pin stop to give the correct scrap bridge width for a blanking die.

**LEARNING ACTIVITIES:**

1. Read "Basic Diemaking" pp. 14-15 and 180-181

**DUTY:** MAKE A BLANKING DIE

**TASK:** Machine Die Components

**PERFORMANCE OBJECTIVE:**

Student will machine the die block sections to blueprint specifications. The student will perform all necessary layouts, machine setups, and operations required to produce these parts to the accuracy specified.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Machine A Punch

**PERFORMANCE OBJECTIVE:**

Student will machine the blanking punch to blueprint specifications.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Machine A Stripper

**PERFORMANCE OBJECTIVE:**

Student will machine the stripper to blueprint specifications.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Machine Stock Guides

**PERFORMANCE OBJECTIVE:**

Student will machine the stock guides to blueprint specifications.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Machine A Stop

**PERFORMANCE OBJECTIVE:**

Student will machine the headed fixed pin stop to blueprint specifications.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Heat Treat

**PERFORMANCE OBJECTIVE:**

Student will heat-treat all the components of the blanking die that requires hardened steel to a hardness of 58-62 on the C scale of the Rockwell hardness tester. The required hardness must be achieved after the tempering operation is complete.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Grind To Size

**PERFORMANCE OBJECTIVE:**

Student will grind all components to the accuracy required.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Assemble Blanking Die

**PERFORMANCE OBJECTIVE:**

Student will assemble the die components, locating each component to within the tolerance required to achieve the piece part dimensions and the cutting clearance specified or determined earlier in this course.

**LEARNING ACTIVITIES:**

Student will use knowledge and skills learned in previous courses and should consult with the instructor.

**DUTY:** MAKE A BLANKING DIE

**TASK:** Make A Trial Run

**PERFORMANCE OBJECTIVE:**

Student will setup the completed die in the punch press with close supervision by the instructor and run a minimum of 25 piece parts. The student and instructor will analyze the piece parts and evaluate the quality of the die.

**LEARNING ACTIVITIES:**

See Instructor

**Note:** Ask questions, do not assume anything. Be safe!