JEFFERSON COLLEGE
COURSE SYLLABUS

MTT 235
INTRODUCTION TO TOOLMAKING
9 Credit Hours

Prepared by:
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Career & Technical Education
Dr. John Keck, Dean
Mary Beth Ottinger, Division Chair
MTT 235 INTRODUCTION TO TOOLMAKING

I. CATALOG DESCRIPTION

A. Prerequisite: MTT 234

B. 9 Credit hours

C. This course will cover the principles of die design, dies, power presses, and how they are used in manufacturing. In addition, students will learn about tool steels, proper selection, and heat treating of tool steels for specific applications. Student will build a two stage stamping die, set-up and run finished die to produce 3/8” washers.

II. EXPECTED LEARNING OUTCOMES / ASSESSMENT MEASURE

<table>
<thead>
<tr>
<th>Students will be able to calculate proper die clearance for specific materials.</th>
<th>In-class exams as well as homework and/or quizzes.</th>
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<tbody>
<tr>
<td>Students will be able to calculate tonnage required to stamp finished parts.</td>
<td>In-class exams as well as homework and/or quizzes.</td>
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<tr>
<td>Students will be able to explain and demonstrate proper safety measures while working around power presses.</td>
<td>In-class exams as well as homework and/or quizzes, and demonstrate while in the lab.</td>
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<tr>
<td>Students will be able to select proper tool steel selection for specific applications.</td>
<td>In-class exams as well as homework and/or quizzes and demonstrate by performing basic task while in the lab.</td>
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<tr>
<td>Students will be able to identify and demonstrate proper use of O.D / I.D grinders.</td>
<td>In-class exams as well as homework and/or quizzes and demonstrate proper selection of correct tooling and set-up while performing task in the lab.</td>
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<tr>
<td>Students will be able to properly set heat treat and draw ovens.</td>
<td>In-class exams as well as homework and/or quizzes and demonstrate while in the lab.</td>
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<td>Students will be able to demonstrate close tolerance grinding.</td>
<td>Lab</td>
</tr>
<tr>
<td>Students will be able to identify major parts of the power press.</td>
<td>In-class exams as well as homework and/or quizzes and demonstrate while in the lab.</td>
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Students will be able to identify all parts of a complete die set.  

| In-class **exams** as well as homework and/or quizzes and demonstrate while in the lab. |

Students will be able to properly set die in power press.  

| Lab |

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III. Course Outline with Unit Objectives

A. Safety
   1. Proper eye protection
   2. Proper clothing selection
   3. Long hair
   4. Jewelry
   5. Lock out / Tag out
   6. Machine specific hazards
   7. E-Stop and safety procedures

B. Power Presses
   1. Press working tools
   2. Punch presses
   3. Brake presses
   4. Set-up
   5. Safety equipment

C. Material Strip
   1. Selection
   2. Tonnage
   3. Die Clearance
   4. Draft Angle
   5. Shear, Bend, Form, and Draw

D. Die Block Design
   1. Material Type
   2. Size Constraints
   3. Punch Type
   4. Governing Factors

E. Punch Plates
   1. Blanking Punches
   2. Piercing Punches
   3. Sectioned Punches
   4. Proto Typing
   5. Stock Strip Deflection
   6. Punch Deflection
F. Stripper Plates
   1. Design
   2. Stripping force
   3. Fasteners
   4. Force Calculations
   5. Material Types

G. Stops
   1. Finger Stops
   2. Automatic Stops
   3. Design
   4. Operation of

H. Tool Steel
   1. Shock Steels
   2. Wear
   3. High Speed
   4. Oil Hardening
   5. Proper Selection

I. Heat Treating
   1. Oven Types
   2. Rockwell Hardness
   3. Case Hardening
   4. S.S Foil
   5. Heat Treat Temperatures
   6. Drawing Process

IV. METHOD OF INSTRUCTION

A. Lecture

B. Discussion

C. Lab

V. REQUIRED TEXTBOOK(S)

Die Design Fundamentals
Third Edition Vukota Boljanovic, J.R. Paquin and R.E. Crowley
ISBN: 0831131195

VI. REQUIRED MATERIALS
1. Textbooks
2. Pencil
3. Calculator
4. Safety glasses
5. 6" steel rule
6. Lathe tool 5/16" (2)
7. Paint brush - 3" or 4"
8. Center drill #2 or #3
9. 2- Acid brushes
10. Allen wrenches (inch)
11. Pocket scribe
12. 8” flat mill file
13. De-burring tool
14. Center gage
15. Pocket scribe
16. 0-1” Micrometer
17. 0-6” Caliper
18. .0005” Test indicator
19. Edge finder

VII. SUPPLEMENTAL REFERENCES

A. Carr-Lane Pocket reference book with trig functions.

VIII. METHOD OF EVALUATION

A. Homework, 15%

B. Attendance, 10%

C. Shop Project, 60%

D. Final Examination, 15%

IX. ADA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-797-3000, ext. 169).

X. ACADEMIC HONESTY STATEMENT
All students are responsible for complying with campus policies as stated in the Student Handbook (see College Website, http://www.jeffco.edu/jeffco/index.php?option=com_weblinks&catid=26&Itemid=84)