METROPOLITAN STATE COLLEGE OF DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of Professional Studies

Department: Engineering Technology Studies

Semester(s) Offered: Spring and Fall

Prefix & Course Number: MET 3250 
Crosslisted With*: ___

Course Title: Tool Design and Production Tooling

Credit Hours: 3 (2+2)

Contact Hours: Lecture 30  Lab 30  Internship ___  Practicum ___

Schedule Type(s): B  Grading Mode(s): L

Repeat* (Variable topics): ___
*(Pertinent only if the course can be repeated; enter maximum number of hours that can be earned by taking this course.)

Restrictions (Variable Topics Course): NONE

Prerequisite(s): MET 2200 and MTH 1120 with grades of “C” or better

Corequisite(s): NONE

Prerequisite(s) or Corequisite(s): NONE

Banner Enforced:
Prerequisite(s): MET 2200 and MTH 1120 with grades of “C” or better
Corequisite(s): NONE
Prerequisite(s) or Corequisite(s): NONE

Catalog Course Description:
The course deals with production tooling requirements and tooling cost estimates. Design of tooling for turret lathes, automatic screw machines, multiple spindle lathes and production milling machines is treated.

Required Reading and Other Materials will be equivalent to (Title, Author, Publisher, Copyright Date):

APPROVED:

______________________________
Department Chair/Institute/Director

______________________________
Dean

______________________________
Associate VP, Academic Affairs

*If cross listed, attach completed Course Cross listing Agreement Form
Prefix and Course Number: MET 3250

SPECIFIC (MEASURABLE) STUDENT BEHAVIORAL LEARNING OBJECTIVES:

Upon completion of this course the student should be able to demonstrate:
1. Have drawing board experience in designing jigs, gages, cutting tools and production tooling.
2. Be knowledgeable in drafting techniques used in tool design activity.
3. Conduct manufacturing analyses and cost estimates.
4. Relate material requirements to tool designs and evaluate the material cost effect von manufacturing costs.
5. Program the set-up and operation of lathes and screw machines.

OUTLINE OF COURSE CONTENT (Major Topics and Subtopics):

I. Tool Design Methods
   A. Research and Ideation (sketches)
   B. Tentative Design Solutions

II. Toolmaking
   A. Tools of the Toolmaker
   B. Screws and Dowels
   C. Hole Location
   D. Jig-Boring Practice

III. Tooling Materials and Heat Treatment
   A. Properties of Materials
   B. Tool Steels
   C. Non-ferrous tooling Materials
   D. Heat Transfer

IV. Design of Cutting Tools
   A. Single-Point Cutting Tools
   B. Milling Cutters
   C. Step Drills
   D. Selection of Carbide Cutting Tools

V. Gages and Gage Design
   A. Gage Tolerances
   B. Functional Gages
   C. Fixed and Indicating Gages

VI. Design of Drill Jigs
   A. Types of Drill Jigs
   B. Methods of Construction
   C. Drill: Bushings

VII. Design of Fixtures
   A. Types of Fixtures
   B. Fixtures and Economics

VIII. Using Plastics as Tooling Materials
   A. Plastics Commonly 'Used as Tooling Materials
   B. Application of Epoxy Plastic Tools
   C. Construction Methods of Plastic Tooling

IX. Turret Lathes and Automatic Screw Machines
    A. Tooling Layouts for Turret Lathes
    B. Tooling Systems for Automatic Screw Machines and Multiple Spindle Lathes

EVALUATION OF STUDENT PERFORMANCE:
25% Quizzes
40% Semester Examinations (20% each)
20% Final Examination
15% Design Drawings.