



CREDIT COURSE OUTLINE

I. COVER PAGE

(1) MFGT 22	(2) Industrial Materials	(3) 2
Number	Title	Units

<table border="1"> <tr> <td colspan="2">(4) Lecture / Lab Hours:</td> </tr> <tr> <td>Course Hours</td> <td></td> </tr> <tr> <td>Weekly Lec hours:</td> <td align="right">2.00</td> </tr> <tr> <td>Weekly Lab hours:</td> <td align="right">0.50</td> </tr> <tr> <td>Total Contact hours:</td> <td align="right">45.00</td> </tr> <tr> <td colspan="2">Lec will generate __ hour(s) outside work.</td> </tr> <tr> <td colspan="2">Lab will generate __ hour(s) outside work.</td> </tr> <tr> <td>(5) Grading Basis:</td> <td>Grading Scale Only</td> </tr> <tr> <td></td> <td>Pass/No Pass option</td> </tr> <tr> <td></td> <td>Pass/No Pass only</td> </tr> <tr> <td>(6) Advisories:</td> <td> <ul style="list-style-type: none"> Eligibility for English 126 and Mathematics 103 </td> </tr> <tr> <td>(7) Pre-requisites (requires C grade or better):</td> <td> <ul style="list-style-type: none"> Industrial Technology 205 </td> </tr> <tr> <td>Corequisites:</td> <td> <ul style="list-style-type: none"> </td> </tr> </table>	(4) Lecture / Lab Hours:		Course Hours		Weekly Lec hours:	2.00	Weekly Lab hours:	0.50	Total Contact hours:	45.00	Lec will generate __ hour(s) outside work.		Lab will generate __ hour(s) outside work.		(5) Grading Basis:	Grading Scale Only		Pass/No Pass option		Pass/No Pass only	(6) Advisories:	<ul style="list-style-type: none"> Eligibility for English 126 and Mathematics 103 	(7) Pre-requisites (requires C grade or better):	<ul style="list-style-type: none"> Industrial Technology 205 	Corequisites:	<ul style="list-style-type: none"> 	<table border="1"> <tr> <td colspan="3">(8) Classification:</td> </tr> <tr> <td></td> <td>Degree applicable:</td> <td align="center">X</td> </tr> <tr> <td></td> <td>Non-degree applicable:</td> <td></td> </tr> <tr> <td></td> <td>Basic skills:</td> <td></td> </tr> <tr> <td>(9) RC</td> <td>Fulfills AS/AA degree requirement: (area)</td> <td></td> </tr> <tr> <td></td> <td>General education category:</td> <td></td> </tr> <tr> <td></td> <td>Major:</td> <td>Machine Tool Technology Maintenance Mechanic Welding</td> </tr> <tr> <td></td> <td>Certificate of:</td> <td>Machinist Maintenance Mechanic Manufacturing 1 Welder</td> </tr> <tr> <td></td> <td>Certificate in:</td> <td></td> </tr> <tr> <td>(10) CSU</td> <td>Baccalaureate:</td> <td align="center">X</td> </tr> <tr> <td>(11) Repeatable: (A course may be repeated three times)</td> <td></td> <td align="center">0</td> </tr> <tr> <td>(12) C-ID:</td> <td></td> <td></td> </tr> <tr> <td>Proposed Start Date:</td> <td></td> <td align="center">Fall 2012</td> </tr> </table>	(8) Classification:				Degree applicable:	X		Non-degree applicable:			Basic skills:		(9) RC	Fulfills AS/AA degree requirement: (area)			General education category:			Major:	Machine Tool Technology Maintenance Mechanic Welding		Certificate of:	Machinist Maintenance Mechanic Manufacturing 1 Welder		Certificate in:		(10) CSU	Baccalaureate:	X	(11) Repeatable: (A course may be repeated three times)		0	(12) C-ID:			Proposed Start Date:		Fall 2012
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(12) Catalog Description:
 Selection / identification of steels, non-ferrous metals and other industrial materials. Heat treatment processes, hardness testing, working characteristics of materials and workplace applications for each, Adhesives/fillers, Material shearing / forming

II. COURSE OUTCOMES:

(Specify the learning skills the student demonstrates through completing the course and link critical thinking skills to specific course content and objectives.)

Upon completion of this course, students will be able to:

- I. Integrate selection / identification of materials into a work environment.
- II. Practice safe shop techniques in operating and servicing industrial working machinery.
- III. Recommend appropriate processes to treat and test industrial materials.

III. COURSE OBJECTIVES:

(Specify major objectives in terms of the observable knowledge and/or skills to be attained.)

In the process of completing this course, students will:

- I. Select proper materials for specific manufacturing operations.
- II. Apply material working principles to correct manufacturing problems.
- III. Compute mathematical formulas and understand basic principles that apply to industrial materials.
- IV. Practice proper maintenance and operation of industrial working machinery.
- V. Learn safety precautions as needed for manufacturing trades.

IV. COURSE OUTLINE:

Lecture Content:

- A. Technology and Careers - career opportunities in high tech fields
 1. Engineer
 2. Machinist technician
 3. Welder
 4. Maintenance worker
- B. Metals – various types and how they are used in industry

1. Steels
 2. Non-ferrous metals
 3. High temperature metals
 4. Exotic space age metal alloys
- C. Shop Safety – safety practices and procedures
1. General safety
 2. Hand tool safety
 3. Machine tool safety
 4. Fire safety
 5. Chemical safety
 6. Electrical safety
- D. Hand Tools and Cutting Tools – various types of tools and their proper uses
1. Tools that strike
 2. Tools that are struck
 3. Cutting tools
 4. Measuring tools and measurement
- E. Forging and Heat Treating
1. Forge / furnace
 2. Work holding tools
 3. Metal hardening and tempering colors
- F. Hardness testing
1. Equipment
 2. Techniques
- G. Shearing/ forming
1. Equipment
 2. Techniques
- H. Adhesives
1. Types
 2. Applications
 3. Repair procedures
- I. Metal Finishes
1. Plating
 2. Anodizing
 3. Machining
 4. Polishing

Lab Content:

- A. Material identification
1. Ferrous
 2. Non-ferrous
 3. Stainless
 4. Plastics
 5. Adhesives
- B. Use of hand tools for finishing
1. Files
 2. Hand cutters
 3. Abrasives
 4. Fit up
- B. Industrial problems
1. Trouble shooting problems
 2. Selecting correct process to repair problem
 3. Staging repair processes to correct a problem
- C. Heat treating
1. Techniques
 2. Steel oxidation colors

V. APPROPRIATE READINGS

Reading assignments may include but are not limited to the following:

I. Sample Text Title:

1. Recommended - Hoffman, P.,J *Modern Metalworking Workbook*, Delmar Cengage Learning, 2012,
2. Recommended - Oberg, E *Machinery's Handbook*, ed. 29 Industrial Press, 2012,

II. Other Readings

- Global or international materials or concepts are appropriately included in this course
 Multicultural materials and concepts are appropriately included in this course

If either line is checked, write a paragraph indicating specifically how global/international and/or multicultural materials and concepts relate to content outline and/or readings.

VI. METHODS TO MEASURE STUDENT ACHIEVEMENT AND DETERMINE GRADES:

Students in this course will be graded in at least one of the following four categories. Please check those appropriate. A degree applicable course must have a minimum of one response in category A, B, or C.

A. Writing			
Check either 1 or 2 below			
1. Substantial writing assignments are required. Check the appropriate boxes below and provide a written description in the space provided.			
X	2. Substantial writing assignments are NOT required. If this box is checked leave this section blank. For degree applicable courses you must complete category B and/or C.		
	a) essay exam(s)		d) written homework
	b) term or other paper(s)		e) reading reports
	c) laboratory report(s)		f) other (specify)

Required assignments may include but are not limited to the following:

B. Problem Solving			
Computational or non-computational problem-solving demonstrations, including:			
X	a) exam(s)		d) laboratory reports
X	b) quizzes		e) field work
X	c) homework problems		f) other (specify):

Required assignments may include but are not limited to the following:

Sample question:
 Select proper materials for prescribed project.

C. Skill demonstrations, including:			
X	a) class performance(s)	X	c) performance exams(s)
	b) field work		d) other (specify)

Required assignments may include but are not limited to the following:

1. Periodic lab assignments assess understanding of metal working principles.
2. Class performance is measured daily for participation, and overall quality of working environment

D. Objective examinations including:			
X	a) multiple choice	X	d) completion
X	b) true/false		e) other (specify):
X	c) matching items		

COURSE GRADE DETERMINATION:

Description/explanation: Based on the categories checked in A-D, it is the recommendation of the department that the instructor's grading methods fall within the following departmental guidelines; however, the final method of grading is still at the discretion of the individual instructor. The instructor's syllabus must reflect the criteria by which the student's grade has been determined. (A minimum of five (5) grades must be recorded on the final roster.)

If several methods to measure student achievement are used, indicate here the approximate weight or percentage each has in determining student final grades.

Problem Solving 20 - 40% Skill Demonstration 40 - 60% Objective Examination 20 - 40%

VII. EDUCATIONAL MATERIALS

For degree applicable courses, the adopted texts, as listed in the college bookstore, or instructor-prepared materials have been certified to contain college-level materials.

Validation Language Level (check where applicable):

- Textbook
- Reference materials
- Instructor-prepared materials
- Audio-visual materials

College-Level Criteria Met	
YES	NO
<u>X</u>	<u> </u>
<u>X</u>	<u> </u>
<u>X</u>	<u> </u>
<u>X</u>	<u> </u>

Indicate Method of evaluation:

- Used readability formulae (grade level 10 or higher)
- Text is used in a college-level course
- Used grading provided by publisher
- Other: (please explain; relate to Skills Levels)

Computation Level (Eligible for MATH 101 level or higher where applicable)

Content

Breadth of ideas covered clearly meets college-level learning objectives of this course

Presentation of content and/or exercises/projects:

Requires a variety of problem-solving strategies including inductive and deductive reasoning.

Requires independent thought and study

Applies transferring knowledge and skills appropriately and efficiently to new situations or problems.

List of Reading/Educational Materials

Recommended - Hoffman, P.,J *Modern Metalworking Workbook*, Delmar Cengage Learning, 2012,
 Recommended - Oberg, E *Machinery's Handbook*, ed. 29 Industrial Press, 2012,
Modern Metalworking, Publisher Goodheart-Willcox 2004 Modern Metalworking Workbook, Publisher Goodheart-Willcox 2004 Machinery's Handbook 28th ed. Industrial Press ©2008

Comments:

- This course requires special or additional library materials (list attached).
 Modern Metalworking, Publisher Goodheart-Willcox 2004 Modern Metalworking Workbook, Publisher Goodheart-Willcox 2004 Machinery's Handbook 28th ed, Industrial Press ©2008
- This course requires special facilities:
 Manufacturing Shop

Attached Files:

- [Manufacturing Pathway](#)
- [MFGT 22 Prereq Adv Justification](#)

BASIC SKILLS ADVISORIES PAGE The skills listed are those needed for eligibility for English 125, 126, and Math 201. These skills are listed as the outcomes from English 252, 262, and Math 250. In the right hand column, list at least three major basic skills needed at the beginning of the target course and check off the corresponding basic skills listed at the left.

<p>Eligibility for ENGL 126 (as outcomes for ENGL 262)</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> apply a variety of vocabulary skills for increased comprehension during reading. <input checked="" type="checkbox"/> apply prereading and active reading strategies to increase success with and comprehension of unfamiliar texts. <input checked="" type="checkbox"/> analyze expository texts to determine explicit/implicit main ideas and logical support, leading to author's intended meaning. <input type="checkbox"/> determine basic organizational writing patterns to increase comprehension of expository texts. <input type="checkbox"/> distinguish between fact and opinion and determine author's tone and purpose in non-fiction writings. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Select proper materials for specific manufacturing operations. <input checked="" type="checkbox"/> Apply material working principles to correct manufacturing problems. <input type="checkbox"/> Compute mathematical formulas and understand basic principles that apply to industrial materials. <input type="checkbox"/> Practice proper maintenance and operation of industrial working machinery. <input type="checkbox"/> Learn safety precautions as needed for manufacturing trades.
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Check the appropriate spaces.

- Eligibility for Math 201 is advisory for the target course.
- Eligibility for English 126 is advisory for the target course.
- Eligibility for English 125 is advisory for the target course.

If the reviewers determine that an advisory or advisories in Basic Skills are all that are necessary for success in the target course, stop here, provide the required signatures, and forward this form to the department chair, the appropriate associate dean, and the curriculum committee.

REQUISITES

Prerequisite -- IT 205 FOUNDATION SKILLS IN INDUSTRIAL TECHNOLOGY

- Recognize the various types of tools, materials, and processes as they relate to manufacturing technology.

- Practice proper maintenance and operation of industrial working machinery.
- Learn safety precautions as needed for manufacturing trades.

ESTABLISHING PREREQUISITES OR COREQUISITES

Every prerequisite or corequisite requires content review plus justification of at least one of the seven kinds below. Prerequisite courses in communication and math outside of their disciplines require justification through statistical evidence. Kinds of justification that may establish a prerequisite are listed below.

Check one of the following that apply. Documentation may be attached.

Significant statistical evidence indicates that the absence of the prerequisite course is related to unsatisfactory performance in the target course.

Justification: Indicate how this is so.

The health or safety of the students in this course requires the prerequisite.

Justification: Indicate how this is so.

The prerequisite course is part of a sequence of courses within or across a discipline.

The prerequisite is required in order for the course to be accepted for transfer to the UC or CSU systems.

Justification: Indicate how this is so.

The prerequisite/corequisite is required by law or government regulations.

Explain or cite regulation numbers:

The safety or equipment operation skills learned in the prerequisite course are required for the successful or safe completion of this course.

Justification: Indicate how this is so.

The safety or equipment operation skills learned in the prerequisite course are required for the successful or safe completion of this course.

Justification: Indicate how this is so.

Three CSU/UC campuses require an equivalent prerequisite or corequisite for a course equivalent to the target course:

Justification:

JUSTIFICATION OF LIMITATION ON ENROLLMENT

Enrollment in courses or blocks of courses may be limited based on performance, honors, or other performance based criteria. Be mindful of the disproportionate impact the limitation will have on specific groups of students. It is important to determine if the limitation will disproportionately keep under-represented students from enrolling in the course or block of courses.

Describe the reasons for limiting the enrollment.

Course Designator: MFGT 22

Course Title(s): Industrial Materials

Rationale for Limiting Enrollment:

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