CREDIT COURSE OUTLINE

I. COVER PAGE

(1) MFGT 23	(2) Electricity	(3) 2
Number	Title	Units

(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		X
		Pass/No Pass only		
(6)	Advisories: • Eligibility for English 126 and Mathematics 103			
(7)	Pre-requisites (requires C grade or better): • Industrial Technology 205			
	Corequisites: •			

(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 Technology	
Certificate of:	Machine Tool 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

(12) Catalog Description:
The study of basic energy sources developed for commercial/manufacturing use. Methods that are used to measure potential difference and power, residential and industrial safety. Basic electrical codes, wire, and industrial troubleshooting. Basic shop electrical repairs and installations.

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. Service and operate electrical systems using safe shop techniques
II. Calculate common mathematical problems associated with electrical systems.

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. Identify the basic components of an electrical system.
II. Apply electrical principles to operating electrical systems.
III. Compute mathematical formulas and understand basic physics principles that apply to electric circuits systems.
IV. Practice proper maintenance and repair of electric circuits.
V. Learn safety precautions as needed in electrical work.

IV. COURSE OUTLINE:

Lecture Content:

A. Sources of electrical energy
1. Static
2. Generators

B. Basic electron theory
1. Alternating current
2. Direct current

C. Formulas for calculating power
1. Voltage
2. Amperage
3. Resistance

D. Instrumentation used in measuring electrical circuits.
1. Galvanometer
2. Continuity tester
3. Multimeters

E. Basic residential wiring techniques
1. Simple switch
2. Three way circuits
3. Electric panels
4. Circuit voltage
1. Low voltage circuits
2. 110 volts
3. 220 volts

F. Single phase and three phase motors and controllers; troubleshooting
1. Single phase
2. Three phase
3. Phase conversion
4. Circuit breakers

G. Electrical safety and basic electrical codes

Lab Content:

Lab Outline

A. Electrical systems hands on units
1. Wiring
2. Switches
3. Circuit protectors

B. Electric motors
1. Single phase
2. Three phase
3. Motor controls

C. Electric trouble shooting
1. Safety
2. Test equipment
3. Proper test procedures

D. Repair
1. Cords
2. Equipment switches
3. Component replacement

V. APPROPRIATE READINGS

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

I. Sample Text Title:
1. Recommended - American Technical Publishers *Electrical Motor Controls,* Electrical Motor Controls, 2011,
2. Recommended - Goodheart-Willcox *House Wiring Simplified,* -, 2011,

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:
Calculate workload of prescribed electrical circuit

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 electrical 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% Skills 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):	College-Level Criteria Met YES	NO
Textbook	X	
Reference materials	X	
Instructor-prepared materials	X	
Audio-visual materials	X	

Indicate Method of evaluation:

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

Computation Level (Eligible for MATH 101 level or higher where applicable)	X	
Content		
Breadth of ideas covered clearly meets college-level learning objectives of this course	X	
Presentation of content and/or exercises/projects:		

Requires a variety of problem-solving strategies including inductive and deductive reasoning.	X	
Requires independent thought and study	X	
Applies transferring knowledge and skills appropriately and efficiently to new situations or problems.	X	

List of Reading/Educational Materials
Recommended - American Technical Publishers *Electrical Motor Controls,* Electrical Motor Controls, 2011,
Recommended - Goodheart-Willcox *House Wiring Simplified,* -, 2011,
House Wiring Simplified, Publisher: Goodheart-Willcox 2006 House Wiring Simplified, Publisher: Goodheart-Willcox 2006 and class handouts
Comments:

__X__ This course requires special or additional library materials (list attached).
House Wiring Simplified, Publisher: Goodheart-Willcox 2006 House Wiring Simplified, Publisher:
__ Goodheart-Willcox 2006 and class handouts
__X__ This course requires special facilities:
__ Shop Facility

Attached Files:
Manufacturing Pathway
MFGT 23 Prereq Adv Justification

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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.

Eligibility for ENGL 126
(as outcomes for ENGL 262)

__X__ apply a variety of vocabulary skills for increased comprehension during reading.
__X__ apply prereading and active reading strategies to increase success with and comprehension of unfamiliar texts.
__X__ analyze expository texts to determine explicit/implicit main ideas and logical support, leading to author's intended meaning.
_____ determine basic organizational writing pattens to increase comprehension of expository texts.
_____ distinguish between fact and opinion and determine author's tone and purpose in non-fiction writings.

__X__ Identify the basic components of an electrical system.
__X__ Apply electrical principles to operating electrical systems.
_____ Compute mathematical formulas and understand basic physics principles that apply to electric circuits systems.
_____ Practice proper maintenance and repair of electric circuits.
__X__ Learn safety precautions as needed in electrical work.

Check the appropriate spaces.

_____ Eligibility for Math 201 is advisory for the target course.
__X__ 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.
- Students will be able to describe basic functions within a manufactuaring career pathway of their choice.
- Identify the basic components of an electrical system.
- Learn safety precautions as needed in electrical work.

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.
__X__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 23

Course Title(s): Electricity

Rationale for Limiting Enrollment:
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