



CREDIT COURSE OUTLINE

I. COVER PAGE

(1) MFGT 91	(2) Motor Control I	(3) 2
Number	Title	Units

<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="3">(4) Lecture / Lab Hours:</td> </tr> <tr> <td colspan="3">Course Hours</td> </tr> <tr> <td style="width:15%;"></td> <td style="width:15%;">Weekly Lec hours:</td> <td style="width:15%; text-align: center;">1.50</td> </tr> <tr> <td></td> <td>Weekly Lab hours:</td> <td style="text-align: center;">1.50</td> </tr> <tr> <td></td> <td>Total Contact hours:</td> <td style="text-align: center;">54.00</td> </tr> <tr> <td colspan="3">Lec will generate __ hour(s) outside work.</td> </tr> <tr> <td colspan="3">Lab will generate __ hour(s) outside work.</td> </tr> <tr> <td colspan="3">(5) Grading Basis:</td> </tr> <tr> <td style="width:15%;"></td> <td style="width:15%;">Grading Scale Only</td> <td style="width:15%;"></td> </tr> <tr> <td></td> <td>Pass/No Pass option</td> <td style="text-align: center;">X</td> </tr> <tr> <td></td> <td>Pass/No Pass only</td> <td></td> </tr> <tr> <td colspan="3">(6) Advisories:</td> </tr> <tr> <td colspan="3">(7) Pre-requisites (requires C grade or better):</td> </tr> <tr> <td colspan="3" style="padding-left: 20px;">• Mfgt 23</td> </tr> <tr> <td colspan="3">Corequisites:</td> </tr> <tr> <td colspan="3" style="padding-left: 20px;">•</td> </tr> </table>	(4) Lecture / Lab Hours:			Course Hours				Weekly Lec hours:	1.50		Weekly Lab hours:	1.50		Total Contact hours:	54.00	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:			(7) Pre-requisites (requires C grade or better):			• Mfgt 23			Corequisites:			•			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="3">(8) Classification:</td> </tr> <tr> <td style="width:15%;"></td> <td style="width:15%;"></td> <td style="width:15%;"></td> </tr> <tr> <td></td> <td>Degree applicable:</td> <td style="text-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 colspan="3">(9) RC</td> </tr> <tr> <td colspan="3">Fulfills AS/AA degree requirement: (area)</td> </tr> <tr> <td colspan="3">General education category:</td> </tr> <tr> <td colspan="3">Major:</td> </tr> <tr> <td colspan="3">Certificate of:</td> </tr> <tr> <td colspan="3">Certificate in:</td> </tr> <tr> <td colspan="3">(10) CSU</td> </tr> <tr> <td></td> <td>Baccalaureate:</td> <td style="text-align: center;">X</td> </tr> <tr> <td colspan="3">(11) Repeatable: (A course may be repeated three times)</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="3">(12) C-ID:</td> </tr> <tr> <td colspan="2">Proposed Start Date:</td> <td style="text-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:			Certificate of:			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: The study of basic industrial motors and motor control for commercial/manufacturing use.

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. Identify electric motor and control systems within a manufacturing environment.
- II. Diagnose electric power transmission problems in a manufacturing environment.

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 a motor control system.
- II. Apply motor control principles to the operation of systems in manufacturing facilities.
- III. Practice safe maintenance and repair of industrial motor control systems.
- IV. Use mathematical formulas and basic physics principles to coordinate industrial electrical motors and control systems.

IV. COURSE OUTLINE:

Lecture Content:

1. Motor Fundamentals
 - A. Definitions
 - B. Basic Principles
2. Motor Operation and Characteristics
 - A. Starting Methods and Characteristics
 - B. Running Characteristics
 - C. Stopping Methods and Characteristics
3. Motor Faults
4. Electrical Definitions
 - A. Voltage
 - B. Current

- C. Resistance
- D. Impedance

- 5. Motor Types
 - A. Single Phase
 - B. Three Phase

- 6. Motor Starters

Lab Content:

- 1. Motor Fundamentals
- 2. Motor Operation and Characteristics
- 3. Motor Faults
- 4. Electrical Definitions
- 5. Motor Types
- 6. Motor Starters

V. APPROPRIATE READINGS

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

- I. Sample Text Title:
and/or

- 1. Recommended - Rockis, G., Mazor, G. *Electrical Motor Controls for Intergrated Systems*, ed. 5 American Technical Publishers, Orland Park, 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. <i>Substantial writing assignments are required. Check the appropriate boxes below and provide a written description in the space provided.</i>		
X	2. <i>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.</i>		
	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)	X	d) laboratory reports
X	b) quizzes	X	e) field work
X	c) homework problems		f) other (specify):

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

- Motor Diagnostics Reports
- Lader logic Diagrams

C. Skill demonstrations, including:			
X	a) class performance(s)	X	c) performance exams(s)

<input checked="" type="checkbox"/>	b) field work	<input type="checkbox"/>	d) other (specify)
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Required assignments may include but are not limited to the following:

- Correct use of VOM meters.
- Trouble shooting electrical circuits.
- Identify dangerous electrical conditions.

D. Objective examinations including:			
<input checked="" type="checkbox"/>	a) multiple choice	<input type="checkbox"/>	d) completion
<input checked="" type="checkbox"/>	b) true/false	<input type="checkbox"/>	e) other (specify):
<input checked="" type="checkbox"/>	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.

- Home Work 25%
- Lab Work 25%
- Quizzes 25%
- Final 25%

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	<u> X </u>	<u> </u>
Reference materials	<u> </u>	<u> X </u>
Instructor-prepared materials	<u> </u>	<u> X </u>
Audio-visual materials	<u> </u>	<u> X </u>

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)

<i>Computation Level</i> (Eligible for MATH 101 level or higher where applicable)	<u> </u>	<u> X </u>
Content		
Breadth of ideas covered clearly meets college-level learning objectives of this course	<u> </u>	<u> X </u>
Presentation of content and/or exercises/projects:		
Requires a variety of problem-solving strategies including inductive and deductive reasoning.	<u> </u>	<u> X </u>
Requires independent thought and study	<u> </u>	<u> X </u>
Applies transferring knowledge and skills appropriately and efficiently to new situations or problems.	<u> </u>	<u> X </u>
List of Reading/Educational Materials		
Recommended - Rockis, G., Mazor, G. <i>Electrical Motor Controls for Intergrated Systems</i> , ed. 5 American Technical Publishers, Orland Park, 2012,		

Comments:

- This course requires special or additional library materials (list attached).
- X This course requires special facilities:
Manufacturing Electrical Lab.

Attached Files:

[Manufacturing Pathways](#)

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)

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

- Identify the basic components of a motor control system.
- Apply motor control principles to the operation of systems in manufacturing facilities.
- Practice safe maintenance and repair of industrial motor control systems.
- Use mathematical formulas and basic physics principles to coordinate industrial electrical motors and control systems.

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 -- MFGT 23 Electricity

- Integrate electric knowledge into a positive work environment.
- Service and operate electrical systems using safe shop techniques
- Calculate common mathematical problems associated with electrical systems.
- Choose appropriate materials for any assigned project.
- Assess electrical problems and choose an appropriate course of action.

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 91
Course Title(s): Motor Control 1
Rationale for Limiting Enrollment: 0