Dual Credit

Industrial Maintenance Technology

Course Syllabus

Fall 2016 / Spring 2017

**Course** **Motor Controls & Lab**

IMT 220 Lecture 3 credit hours

IMT 221 Lab 2 credit hours

**Date/Time**  Monday - Friday

### **Course**

**Description** IMT 220 - Addresses the common symbols used in motor control

circuits, the fundamentals of electrical schematics and wiring diagrams, the principles of relays, motor starters, switches, pilot devices, sensing devices, and indicator lights, and introduces the different types and operations of basic motor control circuits.

IMT 221 - Includes an application of common symbols used in motor

control circuits, fundamentals of electrical schematics and wiring diagrams, principles of relays, motor starters, switches, pilot devices, sensing devices, indicator lights, and the different types and operations of basic motor control circuits.

# **INSTRUCTOR** Paul Spears

# Allen County Career & Technical Center

# Room 135

270-622-4711

# Office Hours:

# Monday – Friday 7:20 – 9:50

# 

# **COLLEGE**

**CONTACT** Brian Sparks, Assistant to the Dean

Transpark

270-901-1228

[brian.sparks@kctcs.edu](mailto:brian.sparks@kctcs.edu)

**PRE-**

#### **REQUISITES** IMT:110/111 Electrical Principles

## COURSE

## OBJECTIVES

* + Shop and electrical safety practices
  + Connecting electrical components to an electrical circuit.
  + National Electrical Code
  + Analyze, construct and troubleshoot series and parallel circuits

**COURSE**

**competencies**

Upon completion of the course, the student will have developed and demonstrated an understanding of the following:

1. Practice and perform safe shop procedures at all times.

2. Apply the technical math required for employment opportunities in maintenance.

3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.

4. Connect control relay systems.

5. Connect a dynamic breaking circuit for AC motors.

6. Test magnetic starters.

7. Connect overload relays into starting control circuits.

8. Connect reduced voltage starters.

9. Connect time delay relays.

10. Connect motor for automatic controls.

11. Connect automatic reduced voltage starter for DC motor control.

12. Connect control relay systems.

13. Connect limit switches.

14. Connect motor control circuits for plug-ins.

15. Connect point starters for DC motors.

16. Connect push button stations.

17. Connect selector switches.

18. Connect sensing devices (non-electric).

19. Connect magnetic starters

**COURSE**

**OUTLINE**

1. Introduction
2. Safety Training
3. Equipment Familiarization
4. Motor Controls Compentents
5. Control Relays
6. Switches
7. Buttons
8. Motor Starters
9. Overloads
10. Timers
11. Sensing Devices
12. Symbols and Print Reading
13. Common symbols and acronyms
14. Circuits
15. Start / Stop
16. Switch Circuits
17. Breaking
18. Overload realys
19. Troubleshooting Circuits
20. Designing Circuits
21. Troubleshooting Compentents
22. Using Test Equipment
23. Taking Measurements
24. Multimeter
25. Test lights
26. Megohmmeter
27. Oscilloscopes

**BLACKBOARD**

Blackboard is not available for this dual credit class.

**COURSE STRUCTURE**

**Exams**: There will be exams given throughout the semester. All exams will be based on material covered in the textbook. **No make-up exams** will be given **unless prior arrangements** have been made with your instructor. All make-up exams must be made up within 5 calendar days of the scheduled exam date; failure to do so will result in the student receiving a zero for that exam.

**Homework Assignments**: Students will be required to submit occasional homework, performed outside of class.

**Class Activities**: Students will be required to participate in all class activity assignments given throughout the semester. **Missed class activities may not be made-up and all absent students will receive a zero for each missed assignment.**

**Technology:**

Students are encouraged to utilize the instructor’s email with any questions or concerns regarding the course. Computers are in the resource room (ROOM 119) and classroom for any computer work; hours for the lab are posted.

**No student is to be in the lab without the instructor & PPE must be worn at all times in the lab**

**Lab Behavior**: While in the lab each student shall act in a mature manner. Do not operate any equipment when the instructor is not present. Do not operate any equipment unless you have been trained to operate it, ask the instructor for help.

**Course Requirements and Evaluation/Grading:**

**Late Coursework:** All assignments, projects, and daily exercises are to be completed/turned in on the due date. Late work is not accepted without prior approval from the instructor.

**\*\*\***It is important to know that if a grade of **“C” or better is not attained,** the course will not count for credit towards a credential.**\*\*\***

**GRADING** Grading Scale Evaluation IMT 220 Evaluation IMT 111

A 90-100 Tests/Quizzes 20% Graded Projects 30%

B 80-89 Daily Grades 40% Daily Grades 30%

C 70-79 Final Exam 40% Final Exam 40%

D 60-69

F Below 60

**Required Text and Materials/Supplies:**

Electrical Motor Control by Alerich/Herman, **ISBN** 0-7768-6164-3 (Provided)

Notebook

Pencil

Calculator

(Optional) - *Wire strippers, Needle nose pliers, Calculator, Meter, Screwdrivers-(Large Phillips, precision Phillips, medium flat, and precision flat)*

**Technical/**

**Media Component:** Videos will be used as needed.

**WORKPLACE ETHICS AGREEMENT**

***Introduction***

Southcentral Kentucky Community & Technical College (SKY CTC) is committed to student success and improving employability of the students. Based on feedback from educators, community leaders, and business and industry partners, workplace ethics practices promoting success in the classroom are incorporated into course expectations. In addition to course and program competencies, student success will be measured by:

* being present and punctual
* participating in academic activities
* maintaining professional behavior

***Present and Punctual***

Students are expected to demonstrate a strong work ethic by being present and punctual for all class sessions. Students will be considered absent if they are tardy or leave before class is dismissed. If a student is absent for more than 15% of the scheduled class sessions, the student will be withdrawn from the course. If this occurs prior to the official withdrawal date, the student will be withdrawn from the course and a “W” issued on their transcript. After the official withdrawal date, the student will be issued a failing grade “E” on their transcript.

\*Note: Due to programmatic requirements, some programs may require students to be present for a higher percentage of classes (more than 85 percent).

***Participation***

Students are expected to demonstrate strong work ethics by actively participating in all class sessions and completing academic activities. Participation includes but is not limited to:

* engaging in and completing activities
* putting forth full effort for the entire class session
* seeking assistance when needed
* maintaining clean and orderly work areas

If at any time a student does not participate in a class session, laboratory, clinical or other scheduled academic activity, it is the student’s responsibility to make satisfactory arrangements for any make-up work, if permitted by the instructor.

***Professional Conduct***

Students are expected to conduct themselves professionally, as outlined in the [Student Code of Conduct](http://www.kctcs.edu/en/Students/Admissions/Academic_Policies/~/media/System_Office/Academics/StudentCode2010.ashx) located on the KCTCS website. Professional conduct includes but is not limited to:

* dressing appropriately
* engaging instructors, college employees, and students with respect
* utilizing technology appropriately
* refraining from disruptive behavior
* modeling behavior appropriate to his/her chosen profession

Any conduct within a course that disrupts the learning environment will result in the student being dismissed, counted absent, and may result in disciplinary action.

**Safety glasses are required in all labs. As well as, leather shoes or steel toe shoes are required in labs. However, leather tennis shoes or athletic shoes are not acceptable in labs.  Ear plugs required where applicable.**

**CLASSROOM**

**ETIQUETTE:** Cell phones should be either turned off or set to vibrate

mode during class. And usage should be to a minimum.

**LATE/MAKEUP**

**POLICY:** Assignments can be made-up with valid excuse (doctor’s notice, funeral announcement, immediate family illness, or other hard-copy proof).

Excerpts from the KCTCS Code of Student Conduct regarding academic honesty policy and academic offenses:

**Withdrawal Policy**: Through the midterm of the session, a student may officially withdraw from a course and receive a “W.” After this period, a student may officially request to withdraw from a course and receive a W which may be given at the discretion of the instructor. Each instructor shall state on the first or second class meeting the factors to be used in determining if a student will be allowed to withdraw during the discretionary period. The student must initiate the official withdrawal. Withdrawal from a course or courses is a serious decision and, in many cases, affects financial assistance and academic progress. In addition, withdrawal does not relieve students from their financial obligation. See the spring 2009 Schedule of Classes for dates.

**Financial Aid Statement**: PELL, SEOG, and Student Loan recipients (Title IV) who stop attending or withdraw prior to the 60% point in the semester may be obligated to repay a portion of their financial aid.

**KCTCS Code of Student Conduct**: Kentucky Community and Technical College System (KCTCS) faculty and students are bound by principles of truth and honesty that are recognized as fundamental for a community of teachers and scholars. The College expects students and faculty to honor, and faculty to enforce, these academic principles. The College affirms that it will not tolerate academic dishonesty including, but not limited to, violation of academic rights of students and student offenses. Students may refer to the KCTCS Code of Student Conduct, [www.kctcs.edu/student/code.htm](http://www.kctcs.edu/student/code.htm), for more information on student rights, academic offenses, and the student’s right to appeal. Further information on student rights is available on the BGTC website under the Become a Student tab, Student Services. ([http://www.kctcs.edu/student/studentcodeof conduct. PDF](http://www.kctcs.edu/student/studentcodeof%20conduct.pdf))

**6.6 Student Discrimination Grievance Procedure**

The Kentucky Community and Technical College System has zero tolerance for illegal discrimination of any kind. Any student who feels he/she may have been discriminated against or subjected to harassment by students or employees because of their race, color, national origin, sex, sexual orientation, marital status, religion, beliefs, political affiliation, veteran status, age, or disability (including denial of a request for an accommodation), has the right to pursue an informal and/or formal discrimination grievance. The informal student discrimination grievance procedure is described below.

The chief student affairs officer or his/her designee shall be responsible for investigating student discrimination grievances. If appropriate, this shall be conducted in collaboration with the college human resources director. Each college shall provide a letter, statement, or poster containing information regarding the KCTCS Student Discrimination Grievance Procedure with the name, address, and phone number of the local chief student affairs officer.

Most difficulties can be resolved by talking to someone. Therefore, students are encouraged to discuss these problems promptly and candidly with the chief student affairs officer or his/her designee.

1. If a student thinks that he/she has been discriminated against, the student shall inform the chief student affairs officer or his/her designee with thirty (30) calendar days of the occurrence of the alleged incident. The chief student affairs officer or

his/her designee shall conduct a preliminary investigation of the discrimination grievance.

1. The student, chief student affairs officer or his/her designee, and other involved

parties shall work informally to negotiate a solution within fourteen (14) calendar days. The informal student discrimination grievance procedure shall be completed within forty-four (44) calendar days of the occurrence of the alleged incident.

1. If the grievance is not resolved to the satisfaction of the student through the informal

grievance procedure, the student may file a formal appeal according to the *KCTCS Student Code of Conduct*.

Contact information: Mr. Kyle Barron

Southcentral Kentucky Community and Technical College

1845 Loop Drive

Bowling Green, Kentucky 42101

Office: (270) 901-4348

Email: kyle.barron@kctcs.edu

**DISABILITY STATEMENT:** Bowling Green Technical College would like to help students with disabilities achieve their highest potential in college. If you need an accommodation because of a documented disability, you are required to register with Disability Services **each semester**. Contact Pam Bulle, Disability Services Director at 901-1202. If you require assistance during an emergency evacuation, notify Disability Services immediately.

The information on this syllabus is subject to change at anytime. Each student will be notified of any changes during the semester.