Motor Controls II

SPRING 2020

Term: 4196

**Lecture: Class # 78255; Section J382; TR, 800-8:50**

**Lab: Class# 78258; Section J382; TR, 9:00-10:40**

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| Instructor Information | | | | | | |
| Instructor: | Mike Binzer | | **Email**: | | ATC 117 (Cubicle Farm) | |
| Office/Mailbox: | ATC 117 (Cubicle Farm) | | **Office Phone:** | | 859-246-6518 | |
| Office Hours: | Monday & Wednesday 11:00-1:30 | | | | | |
| Weblocker: | <https://grace.bluegrass.kctcs.edu/~mbinzer0001/shared_files/> | | | | | |
| Course Weblocker: | <https://grace.bluegrass.kctcs.edu/~mbinzer0001/shared_files/EET272_Motor_Controlls_II/> | | | | | |
| Advanced Manufacturing & Trades Division Info | | | | | | |
| AMT Coordinator: | *Ralph Potter* | [*ralph.potter@kctcs.edu*](mailto:ralph.potter@kctcs.edu) | | *AMC Room 112* | | *(859) 246 – 6770* |
| IMT Coordinator: | *Mike Binzer* | [mike.binzer@kctcs.edu](mailto:mike.binzer@kctcs.edu) | | *AMC Room 117* | | *(859) 246 - 6518* |
| Assistant Dean: | *Ralph Potter* | [*ralph.potter@kctcs.edu*](mailto:ralph.potter@kctcs.edu) | | *AMC Room112* | | *(859) 246 – 6770* |
| Website: | [*https://bluegrass.kctcs.edu/education-training/program-finder/industrial-maintenance.aspx*](https://bluegrass.kctcs.edu/education-training/program-finder/industrial-maintenance.aspx) | | | | | |
| Bluegrass Community & Technical College Information | | | | | | |
| BCTC Website: | [www.bluegrass.kctcs.edu](http://www.bluegrass.kctcs.edu/) | |  | | | |
| KCTCS Blackboard: | [https://elearning.kctcs.edu](https://elearning.kctcs.edu/webapps/portal/frameset.jsp) | |  | | | |
| KCTCS MyPath: | Type in Browser: **mypath.kctcs.edu** | | Single Sign-on KCTCS portal to Email, Blackboard, OneDrive, Student Self-Service, STARFISH, and more. | | | |

# OFFICIAL COURSE INFORMATION

**COURSE DESCRIPTION:** This course addresses the diversity of control devices and applications used in industry. Safety and electrical lockouts are also included.

**PREEQUISITES:** EET 271; COREQUISITES: EET 272

**CREDIT:** Lecture: 2.0 credit hours Lab: 2.0 credit hours

**Task List:**

1 Plan an orderly shutdown procedure to conduct planned maintenance

2 Design and build control circuits utilizing electronic sensing devices

3 Design and build control circuit utilizing electronic output devices

4 Install drum switch for motor controls

5 Program a programmable logic controllers (PLC)

6 Install PLC to replace relay systems

7 Install PLC to operate fluid power systems

8 Install forward/reverse control for three-phase motors

9 Install inching, jogging control of three-phase motors

**\*\*OFFICAL COURSE OUTLINE\*\* See Course Calendar, in the Course Weblocker, for the planned dates**

1. Describe common symbols.

2. Apply proper wiring techniques utilized in termination of electronic/electrical equipment...

3. Translate relay logic schematics to working circuit.

4. Fabricate I/O configuration using serial and parallel.

5. Design simple programmable controller applications.

6. Program PLC’s.

7. Install PLC systems to replace relay systems.

8. Install PLC systems to operate fluid power systems.

9. Plan a shutdown procedure for PLC managed equipment.

10. Troubleshoot hardware faults using PLC’s.

11. Plan an orderly shutdown procedure to conduct planned maintenance.

12. Design and build control circuits utilizing electronic sensing devices.

13. Design and build control circuits utilizing electronic output devices.

14. Install drum switch for motor controls.

15. Program a programmable logic controller.

16. Install forward/reverse control for three-phase motors.

17. Install inching, jogging control of three-phase motors.

**COURSE WEBLOCKER**: See the Course Weblocker for the Lecture and Lab Calendar. The schedule will change to adjust for snow-days and other issues throughout the semester:

## CLASS MATERIALS

**Required Technology:** N/A

**Required Textbook:** Understanding Motor Controls; Stephen L. Herman 4rd edition; ISBN-13: 978-1-337-79868-6

**Required Supplies**: Safety Glasses; Multimeter (Recommend Amp-Clamp V, Ω, A with .1 Amp Sensitivity)

## CLASS POLICIES AND EXPECTATIONS

**Attendance**:

Since attendance is an integral part of your education and job preparation process, you are expected to be punctual and attend all class meetings. Absences from class prohibit students from obtaining pertinent instruction and information necessary to meet class objectives and students with absenteeism problems often find themselves having academic difficulties. Students with 20% (approx. 6 classes) of absences will receive a failing grade and it is recommended that the course be dropped.

The student will have the option of meeting with the Assistant Dean regarding absences. At this time, the student will be able to present physical and/or electronic documentation as to the reason for the absences. The documentation must include electronic communications with the instructor.

Technical courses are often prerequisites to other classes and failure to pass a class will result in repeating the course and a delay of graduation. If the lecture and lab are separate courses but related in content, failure in one will result in the repeating of both.

**Professional Dress:**

Because of safety and other concerns in the High Bay Area of BCTC’s Advanced Manufacturing Center in Georgetown, the following dress code has been established, with the approval of the college's administration, and is enforced.

**Students not properly dressed will be asked to leave with the option to return in proper attire, which could result in being considered absent or tardy.**

**General Attire**

* Use of offensive, obscene, and/or abusive words or symbols on clothing is not permitted. This includes the use of emblems, insignias, badges, or other symbols or lewd or vulgar words where the effect is offensive to a reasonable person or otherwise causes disruption or interference with the orderly operations of the Advanced Manufacturing Center. BCTC faculty and staff may determine if an individual’s clothing violates any of the campus’ dress code.
* Generally, common sense and good taste should prevail in matters of dress.

**Footwear**

* **NO** open-toed shows are allowed, as this is a safety hazard, this includes Crocs™ or any type of closed sandals. Leather shoes are preferred, but are not required.
* In areas requiring steel-toe or any leather shoes no other footwear will be permitted. Please refer to the PPE Guide for that area.

**Pants**

* NO shorts or cropped pants are allowed.
* Jeans or khakis are required with no major rips or tears.

**Tops/Shirts**

* Tank tops, halter-tops, tube tops, and sleeveless shirts are unsafe and strictly prohibited.

**Hair/Hats**

* Long hair is to be put up or placed in a ponytail while in labs or near machinery. This is to protect the individual from serious injury.
* Ball caps and hoods may be worn as long as they are in accordance with the area PPE.

***\*\* For documented medical, religious, or extenuating circumstances, the administration is authorized to approve exceptions to the above requirements.***

## CLASS REQUIREMENTS

Students are expected to be prepared for class and in class, prepared to begin at the scheduled time. Homework will be due at the beginning of the class the assignment is due, following questions on the assignment. See the Course Calendar for due dates. The course calendar will change as necessary and the up to date calendar can always be found in the Class Weblocker.

## MAKE-UP WORK/LATE WORK

In order to keep up with the class schedule, it is pertinent to the student’s success that they be diligent in their studies and lab assignments.

**Make-Up Work:**

If an absence is considered excused by the instructor, you are responsible for handing in any late work, or to schedule a missed Quiz or Exam the day you return.

\*\*\*For an absence to be considered excused, you are required to contact your instructor by e-mail no later than 8:00 AM the day the absence occurs. Excused absences include verified family illness or death, accident or injury, and military or jury duty. \*\*\*

**Late Work:**

Late work may be turned in for full credit for excused absences. For unexcused absences the work may be accepted at the instructor’s discretion. If the homework is turned in prior to the homework being returned to the class, it may be considered for 90% credit. If the homework has already been returned to the class, the highest grade possible will be 70%.

## COURSE GRADE

***Cheating, including plagiarism, or aiding another in cheating is prohibited and will not be tolerated***. See Student Code of Conduct for maximum penalties.

The lecture and lab will be integrated in this course so the student will receive the same final grade in both the Lab and Lecture.  Receiving less than a C in this lecture and lab will result in having to re-take the course and may result in dismissal from the AMT Program and delay of graduation.

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| --- | --- |
| **Category** | **Percentage** |
| Lecture Quizzes & Exams | 15% or 40% |
| Lab Quizzes and Exams | 15% or 40% |
| Lecture Homework | 15% or 40% |
| Lab Assignments | 15% or 40% |
| Professional Behaviors | 15% or 40% |
| TOTAL POSSIBLE | \*\*\*100% |

\*\*\*The category with the lowest value at the end of the semester will account for 40% of your Final Grade.

There will be 6 Quizzes, a Midterm Exam and a Final Exam in both the lecture and the lab. All of the Quizzes combined will be weighted equal to the Midterm which will be equal to the Final.

There will be a number of Homework assignments all weighted equally and a number of Lab assignments all weighted equally.

**Professional Behavior:**

All students begin the semester with 100 points for this grading category. Failure to achieve any of the criteria listed below will result in a deduction of 5 points per occurrence from the 100 points.

* Safety (any occurrence the instructor deems unsafe) eg., PPE
* Attendance/Ready to work (textbook, paper, and pencil)
* Plans order of work/Analyzes details thoroughly
* Working/staying on task eg., cellphones
* Neat and orderly work habits/5S
* Problem solving abilities (work on own, self-starting)

For example. You have 100 points for your professional behavior category. You are seen not wearing your safety glasses in the lab area, and you were not staying on task. You would now have 90 points for the professional behavior category. (Deduction of 5 points for safety violation plus deduction of 5 points for not staying on task)

## WITHDRAWAL POLICY

It is the student’s responsibility to understand the effect dropping will have on graduation requirements, financial aid, and eligibility for sponsorship. Student withdrawals will be allowed after mid-term.

**For more information and Instructions on how to withdraw from a class:**

<https://bluegrass.kctcs.edu/current-students/registrar/withdrawal-policy.aspx>

## WEATHER OR EMERGENCY CLOSING INFORMATION

Inclement weather or other emergencies may cause BCTC classes to be cancelled or delayed.  If classes are delayed, you are to report to school at the announced time and attend the class where you would NORMALLY be at that time.  Information about cancelled or delayed classes will be posted on the BCTC website.  Many local radio and television stations will also carry announcements, **DO NOT TRUST THE MEDIA.**  Instructors may send email messages and/or Blackboard announcements regarding assignments for a class that was cancelled.  Students are responsible for checking these sources for such messages.

## BCTC COLLEGE POLICIES AND RESOURCES

## BCTC College Policies and Resources

<https://bluegrass.kctcs.edu/academics/media/policies-and-procedures-updates/bctc_college_policies_and_resources.pdf>

Web document Includes more information about BCTC College Policies and Resources, including College Contact Info, email, campus closing for weather information, withdrawal policies, Student Code of Conduct, financial aid, emergency closing, tutoring info, and more.

## ACCOMMODATIONS:

Students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for a course, must contact BCTC’s Disability Support Services (DSS) Office. Students should not request accommodations directly from the instructor.

• DSS Website:

<https://bluegrass.kctcs.edu/about/student-life/accessibility-services/index.aspx>

• DSS Email: [BL\_DSS@kctcs.edu](mailto:BL_DSS@kctcs.edu)

• DSS Toll-Free Phone: 1 - 866 - 774 - 4872 ext. 6728