



**Angelina College  
Technology and Workforce Division  
ELPT 2331 AC/DC Drives  
Instructional Syllabus**

**I. BASIC COURSE INFORMATION:**

**A. Course Description:**

Three hours credit. Installation and maintenance of alternating current (AC) and direct current (DC) variable speed drives with emphasis on application, operating characteristics, and troubleshooting techniques. Students will be able to explain technical terms associated with AC and DC drive systems; differentiate between the basic types of control logic and schemes used for AC and DC speed control; compare the advantages and disadvantages of AC versus DC drive systems; program AC and DC drives for specific applications; and troubleshoot drives to board level. Prerequisite: ELPT 1411. Two lecture and three lab hours each week. Lab fee.

**B. Intended Audience:**  
Intermediate

**C. Instructor:** David Turbeville  
Office Location: TW-111  
Office Hours: Monday and Tuesday 11am-Noon  
Phone: (936) 633-5246 (Front Office)  
E-mail Address: dturbeville@angelina.edu

**II. INTENDED STUDENT OUTCOMES:**

**A. Core Objectives Required for this Course**

- 1. Critical Thinking:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
- 2. Communication:** to include effective development, interpretation and expression of ideas through written, oral and visual communication.
- 3. Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

**B. Course Learning Outcomes for all Sections**

1. Explain technical terms associated with AC and DC drive systems.
2. Differentiate between the basic types of control logic and schemes used for AC and DC speed control.
3. Compare the advantages and disadvantages of AC versus DC drive systems.
4. Program AC and DC drives for specific applications
5. Troubleshoot drives to board level.

**III. ASSESSMENT MEASURES**

**A. Assessments for the Core Objectives:**

- 1. Critical Thinking:** Students will design a motor speed control system, requiring students to understand electrical requirements, interpret wiring diagrams, develop a plan and complete installation. A standard rubric is used to assess this objective.
- 2. Communication:** Students are required to develop a presentation to discuss the operation of their motor speed control system. A standard rubric is used to assess this objective.
- 3. Teamwork:** Students will work together in small groups to develop their unique final design project. A standard rubric is used to assess this objective.



## **B. Assessments for Course Learning Outcomes**

1. Students will identify technical terms associated with AC and DC drive systems through questions included in the midterm exam. Performance is assessed using a rubric.
2. Students will differentiate between the basic types of control logic and schemes used for AC and DC speed control through questions included in the midterm exam. Performance is assessed using a rubric.
3. Students will identify the advantages and disadvantages of AC versus DC drive systems through questions included in the midterm exam. Performance is assessed using a rubric.
4. Students will program AC and DC drives for specific applications. Performance is assessed for wiring methods, documentation and correct operation using a checklist.
5. Students will work in small teams to troubleshoot drives to board level during their unique final design project. Performance is assessed for accuracy, time and proper operation using a checklist.

## **IV. INSTRUCTIONAL PROCEDURES:**

This course is being delivered in a hybrid format. This means is that some instruction will be delivered outside of the classroom. Content delivered outside of the classroom may include, video, audio, images and links to external websites. Students are encouraged to consult with their instructor if additional instruction is needed.

Lab activities are required in this course. The lab portion of the class appears on your schedule along with a room number. Attendance during the on-campus part of the course is mandatory. Completion of in-class work is also mandatory.

## **V. COURSE REQUIREMENTS AND POLICIES:**

### **A. Required Textbooks and Recommended Readings, Materials and Equipment**

Lab manual: Adjustable Frequency AC Drive Control System Student Manual, ISBN 978000ACD100

Equipment:

1. 3M Safety Glasses (11326-00000-20)
2. EMT Tool Kit # M2O39875RV1
3. Texas Instrument TI-30X IIS Scientific Calculator

### **B. Course Policies – This course conforms to the policies of Angelina College as stated in the Angelina College Handbook.**

1. **Academic Assistance** – If you have a disability (as cited in Section 504 of the Rehabilitation Act of 1973 or Title II of the Americans with Disabilities Act of 1990) that may affect your participation in this class, you should see Steve Hudman in the Student Center. At a post-secondary institution, you must self-identify as a person with a disability; Mr. Hudman will assist you with the necessary information to do so.
2. **Attendance** – Attendance is required as per Angelina College Policy and will be recorded every day. Any student with three (3) consecutive absences or four (4) cumulative absences may be dropped from the class. Records will be turned in to the academic dean at the end of the semester. Do not assume that non-attendance in class will always result in an instructor drop. **You must officially drop a class or risk receiving an F.** This is official Angelina College Policy.
3. **Additional Policies Established by the Instructor**
  - Cell phones are very distracting, but also useful. Please limit your use of them during our class time. Step out of class if you have to take a call.
  - Because safety is valued in the workplace, if you choose to ignore the safety guidelines of the class, I must



drop you from class. Please adhere to our safety guidelines.

- Handling conductors energized above 48V is not allowed.
- The EMT Tool Kit contains professional quality tools, and is required for this and all classes that have a lab. It is available through the AC Bookstore.
- Food is not allowed in class or lab. Drinks with a lid are allowed, but liquids create a slip and shock hazard. Whoever spills it, cleans it up.
- I use a sign-in / sign-out sheet to document attendance time. Grading includes a participation score, which is based on time in class. If you forget to sign in or out, you are absent.
- I assess your abilities in class. Employers expect that you can perform on the job. Please spend time outside of the classroom studying the technical material so that you can demonstrate both confidence and ability after completing the class.
- If a team project is assigned, each student must demonstrate ability to construct, operate or modify the project.
- Students should be ready to make a short (3 minute) presentation on a class topic at any time. I will randomly select one or more students from the sign-in sheet each class period.

#### **VI. COURSE OUTLINE: Description of the Course Activities including due dates, schedules, and deadlines.**

At a minimum, there will be a midterm exam consisting of a written exam as well as a demonstration of skills. In addition, there will be a final exam which also consists of a written exam and a demonstration of skills. Additional assignments and quizzes will be delivered through Blackboard during the course of the semester.

#### **VII. EVALUATION AND GRADING:**

Some assignments are delivered through Blackboard. Exams are generally given only in class. Your score for the course is based on the percentage of points achieved. Extra points are not available. Attendance is required and accounts for 15% of available points in the form of a participation grade..

Above 89.5%	A
between 79.5 and 89.5%	B
between 69.5 and 79.5%	C
between 59.5 to 69.5%	D
Below 59.5%	F

Our goal is to become proficient with tools and equipment. Attendance is always at your discretion, however if you are in attendance for less than 85% of available class time, you will not receive the participation points. Please be on time for class, and stay until class is over.

If you finish an assignment, repeat it to reinforce technique and familiarity. If you must be absent, notify your instructor. If your instructor must be absent, an alternative assignment will be made available through Blackboard, and those course hours will not be included in the 85% attendance requirement, but the alternative assignment will be included in the available points.

You must notify your instructor through email if you will not be in class. Our reason for including a participation score is to encourage active participation during class hours. Use your time as wisely as possible.



To potential employers, your grade has meaning. Employers typically do not have a lot of time to train a new person, they will expect that you are able to work safely, and have familiarity with tools and equipment. You will likely have to read user manuals and technical documents when there is no help available.

- A Expert
- B Highly-Proficient
- C Capable
- D Ability is in Question
- F Avoid

Most students want an A or B in a class. An A means that you can handle any problem with ease. Experience has shown that most students feel uneasy or have basic questions about technical material, even at the end of a course. This means that while our average may be high, you may be performing at a C level. Although we may work in a team during some activities, be sure that your personal ability reflects your average in the course.

Team activities will be scored at lower point levels than individual activities. The importance of being able to demonstrate ability cannot be overstressed. Our hourly attendance policy is designed to encourage you to remain the full class time to allow for practice.

- A. The instructor may modify the provisions of the syllabus to meet individual class needs by informing the class in advance as to the changes being made.
- B. As a student enrolled in a Technology & Workforce program, you will encounter certain risks while you are in a classroom, laboratory experience, or in a clinical or practicum setting. In the event that you sustain an injury and/or require any medical testing or care, all resulting medical expenses (hospital, ambulance, or physician fees), are your financial responsibility and not the responsibility of Angelina College or the clinical/practicum site.
- C. Effective August 27, 2012 Angelina College prohibits the use of tobacco products on campus, except in your personal vehicle. This measure was approved by the College Board of Trustees, and includes smoking and smokeless tobacco products.