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: TBA
Phone: 936 633-5246 (front office)
E-mail Address: dturbeville@angelina.edu (email is the best way to contact me)

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

Textbook: Electronic Variable Speed Drives, 3nd Edition. Author: Michael E. Brumbach.

Lab manual: Adjustable Frequency AC Drive Control System. Author: Technical Education Systems.

Equipment –

1. ANSI Z87.1 Clear Safety Glasses
2. Precision Electrical Screwdriver Set (Harbor Freight # 96075 or equivalent)
3. Insulated Wire Cutter/Stripper (Harbor Freight #98410 or equivalent)
4. Diagonal Cutting Pliers Klein D228-7 or equivalent
5. 9 in 1 Screwdriver Hilmer model 1839053 or equivalent
6. Meter should be one of the following: Klein CL3200, Fluke 323 or Southwire 21050T)
7. Non-Contact Voltage Detector Fluke-1AC-A1-II or equivalent.
8. 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 (936 633-5293) shudman@angelina.edu 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 of 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

- 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.
- Use only insulated tools while working around electrical equipment. do not use knives or multi-tools in place of appropriate tools.
- Food is not allowed in class or lab. Drinks with a lid are allowable in the classroom but not in the lab areas. Liquids create a slip and shock hazard. Spills must be cleaned up by the person who spills the drink.
- I want you to succeed in this and all classes. Cell phones can be distracting, and should be set to vibrate. Texting and social media have become part of our daily lives, and are now a habit for many people. Like any habit, it will easily distract you from class. Please limit yourself to essential use of the phone. It is a powerful tool for looking up information. Step out of class if you have to take a call.
- I use a sign-out sheet to document attendance. It is available at approximately 20 minutes prior to the end of class.
- There will be a daily quiz or demonstration of skills. It will take place at the end of class. Our goal is your success in class, but also upon graduation. We want you to be able to demonstrate confidence and ability upon leaving the class.
- If a team project is assigned, each student must demonstrate ability to construct, operate or modify the project.
- All communication concerning assignments are sent to your Angelina College student email address.
- 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. <u>EVALUATION AND GRADING:</u>

All exams and assignments are delivered through Blackboard. Each exam and assignment is assigned a point value. Your score for the class is based on the percentage of points achieved. Extra points are not available. Attendance is not counted as a score.

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

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.