ELC-117, Motors and Controls

Orientation and Introduction

Introduction

Concept Content:

In this section you will give an introduction of yourself to your class. This is an opportunity to state your relevant experiences and credentials to teach this subject along with your personal background. This can help connecting with students. You can make a video introduction and upload it to this page as well.

Also, this is where you will give a brief overview of the course and what it's contents will be. There is a section later on in this module where you will give more detail about the course.

Course Syllabus

Concept Goals:

Insert the student learning outcomes for the course here.

Concept Content:

This is where you will upload the syllabus. You can do this either by uploading the syllabus text here or you can upload a copy of the syllabus under the resources tab for this section. If you do upload it to the resources, please be sure to give instructions to your students to look for the syllabus there.

Course Resources

Concept Goals:

You can leave this section blank provided you uploaded the student learning outcomes to the previous section.

Concept Content:

This is where you would outline student support resources such as tutoring services, listing your office ours, contact info for support for your college's learning management system, etc. If there are documents you wish to upload, be sure to upload them to the resources tab and give instructions for the students to find the documents there.

Course Overview

Concept Goals:

By the end of this course, you should:

1. **Describe and operate control transformers, motor starters, and relays. Analyze and troubleshoot motor control circuits.**

2. **Understand fundamental concepts of process control systems and associated terminology.**

3. **Demonstrate the ability to identify and interpret electrical symbols and components on schematics.**

4. Understand fundamental concepts of electricity, including circuit components, measurements, and different circuit types.

Concept Content:

This course introduces the fundamental concepts of motors and motor controls. Topics include ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. Upon completion, students should be able to properly select, connect, and troubleshoot motors and control circuits.

Module	Module Learning Objectives
Electrical Quanities and Basic Circuits	• Identify the parts of an atom (SLO 4) • Describe how electrical flow works (SLO 4) • Define series and parallel circuits (SLO 4)
Symbols and Diagrams	• Identify industrial electrical symbols (SLO 3) • Understand how solenoids and electrical contactors work (SLO 4) • Understand how blueprints work (SLO 3)
Test Instruments	• Demonstrate the ability to read a digital multi-meter (SLO 4) • Identify the functions and uses of a digital multi-meter (SLO 4) • Identify hand tools accurately (SLO 4)
Electrical Safety	• Describe what PPE is (SLO 4) • Demonstrate the ability to do lockout/tagout (SLO 2) • Describe what electric shock is and how to avoid it (SLO 4)
Control Logic	• Describe how circuit logic woks in various scenarios (SLO 4) • Understand various functions of buttons in control circuits (SLO 4) • Describe how to troubleshoot control circuits (SLO 4) • Understand how to read line diagrams (SLO 3)

Mechanical Input Control Devices and Semiconductor Inputs	• Describe how truth tables work (SLO 2) • Understand how various industrial switches work (SLO 2) • Understand what issues can arise when installing control devices (SLO 2)
Solenoids	• Accurately describe how relays work (SLO 1) • Accurately describe the workings of electromagnets (SLO 4) • Accurately describe the workings of solenoids (SLO 4)
Mid-Term Exam	• Demonstrate understand of course material thus far
Transformers	• Describe the process of checking transformer resistance (SLO 1) • Understand transformers losses (SLO 1) • Understand the differences between "H" and "X" markings on a transformer (SLO 1)
Contactors and Motor Starters	• Describe how magnetic motor starters work (SLO 1) • Understand what types of switches would be used in what situations (SLO 1) • Describe the differences between a starter and a contactor (SLO 1)
DC Motors	• Wire an AC motor to specifications (SLO 1) • Correctly describe the parts of a AC motor (SLO 1)
AC Motors	• Wire an AC motor to specifications (SLO 1) • Correctly describe the parts of a AC motor (SLO 1)
Reversing Motors Traditional	• Wire a three phase motor (SLO 1) • Describe various methods for fixing/troubleshooting reversing motors (SLO 1)
Motor Drives Week	• Define and describe motor drives (SLO 1)
Final Exam	• Demonstrate an understanding of course material

Instructor Note: This is a 15 week course. If you need a 16th week due to your semesters being 16 weeks, you may have to create a 16th week.

Course Schedule: **(Instructor Note: this course schedule is just a suggestion based on North Carolina System standards. You can adjust the schedule as suits your needs.)**

Week 1:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 2:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 3:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 4:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 5:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 6:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 7:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 8:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 9:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 10:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 11:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 12:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 13:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 14:

Monday Class 1 - Lecture Material - 1 Hour: Wednesday Class 2 - Lab Material - 1.5 Hours

Week 15:

Monday Class 1 - Final Exam

Notes/Helpful Tips

Next Steps...

Your Census assignments are REQUIRED in order to remain in the class and they MUST be completed prior to the Census Date **[insert census date here]**. **If you do not have a census date requirement, you can delete this section.**

Effective note taking is also important for not only this course, but for your career as well. Note taking is a great way to retain information. The process of taking notes can keep you alert and focused on the information being presented. It also keeps your mind engaged with what you are hearing, increasing the likelihood you will retain that information. Note taking can also allow you to better organize your thoughts on the information being discussed.

Here is a video that provides some tips for effective note taking.

Module 1

1.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Identify the parts of an atom (SLO 4)
- Describe how electrical flow works (SLO 4)
- Define series and parallel circuits (SLO 4)

Concept Content:

This week we begin our course on Motors and Controls. This week's section is on electrical quantities and basic circuits. See module 1.2 for more detail.

This Week At a Glance:

Reading:

Chapter 1 - Electrical Quantities and Basic Circuits - 26 Slides

Chapter 1 Part 2 - Electrical Quantities and Basic Circuits - 10 Slides

Source:

Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Chapter 1 Lecture - 53 Slides

Videos:

How Electricity Works - 10 Minutes

Series and Parallel Circuits - 5 Minutes

Assignments:

Module Review Quiz - Questions

1.2 Module Content Resources

Concept Content:

This week we will go over the basics of electricity and circuits. This will include a sections on electrical theory, circuits, magnetism, and power.

This Week's Material:

Reading:

Chapter 1 - Electrical Quantities and Basic Circuits - 26 Slides

Chapter 1 Part 2 - Electrical Quantities and Basic Circuits - 10 Slides

Source:

Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Chapter 1 Lecture - 53 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

How Electricity Works - 10 Minutes - This video provides visual examples and expands upon some of the concepts discussed in chapter 1.

Series and Parallel Circuits - 5 Minutes - This video highlights how series and parallel circuits work.

1.3 Module Assessment/Assignment

Concept Content:

This Week's Assignment:

Module Review Quiz - 12 Questions

1.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

1.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

1.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- Identify the parts of an atom (SLO 4)
- Describe how electrical flow works (SLO 4)
- Define series and parallel circuits (SLO 4)

Concept Content:

This week we discussed electrical quantities and basic circuits. Next week we will discuss symbols and diagrams.

This Week In Review:

Reading:

Chapter 1 - Electrical Quantities and Basic Circuits - 26 Slides

Chapter 1 Part 2 - Electrical Quantities and Basic Circuits - 10 Slides

Source:

Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Chapter 1 Lecture - 53 Slides

Videos:

How Electricity Works - 10 Minutes

Series and Parallel Circuits - 5 Minutes

Assignments:

Module Review Quiz - 12 Questions

Module 2

2.1 Module Overview

Concept Goals:

By the end of this week you should:

- Identify industrial electrical symbols (SLO 3)
- Understand how solenoids and electrical contactors work (SLO 4)
- Understand how blueprints work (SLO 3)

Concept Content:

This week we will discuss electrical symbols and circuits. See module 2.2 for more detail.

This Week At A Glance:

Reading:

Chapter 2 Symbols and Diagrams - 20 Slides

Solenoid 101: What is a Solenoid - Webpage. This article goes into more detail about what a solenoid is.

Industrial Electrical Symbols - Handout

Lecture:

Chapter 2 Lecture - 30 Slides

Videos:

Schematic Diagrams & Symbols, Electrical Circuits - 17 Minutes

Understanding Blueprints: Electrical Symbols Explained - 19 Minutes

Assignment:

Electrical Symbol Quiz

2.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will cover symbols and diagrams. We will look over both the language of control and electrical circuits. This will include going over various symbols and how to read them, how to utilize blueprints, and how basic circuits work. These are foundational skills needed in order to carry out operations in an industrial setting.

This Week's Material:

Reading:

Chapter 2 Symbols and Diagrams - 20 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Solenoid 101: What is a Solenoid - Webpage. This article goes into more detail about what a solenoid is.

Source: (n.d.). *Solenoid 101: What is a solenoid?*. TLX Technologies. https://www.tlxtech.com/articles/solenoid-101-what-is-a-solenoid

Industrial Electrical Symbols - Handout

Lecture:

Chapter 2 Lecture - 30 Slides - (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Schematic Diagrams & Symbols, Electrical Circuits - 17 Minutes - This video provides a visualization of the concepts from the textbook chapter and lecture presentation. It also provides more detail on schematics for basic types of electrical circuits.

Understanding Blueprints: Electrical Symbols Explained - 19 Minutes - This video provides visual examples of symbols and how to read them in the context of a blueprint.

2.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignment:

Electrical Symbol Quiz - 10 Questions

The handout you were given in module 2.2 is what this quiz will be based on.

2.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

2.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

2.6 Module Wrap-Up

Concept Goals:

By the end of this week you should:

- Identify industrial electrical symbols (SLO 3)
- Understand how solenoids and electrical contactors work (SLO 4)
- Understand how blueprints work (SLO 3)

Concept Content:

This week we discussed electrical symbols and circuits. Next week we will look into test instruments.

This Week In Review:

Reading:

Chapter 2 Symbols and Diagrams - 20 Slides

Solenoid 101: What is a Solenoid - Webpage. This article goes into more detail about what a solenoid is.

Industrial Electrical Symbols - Handout

Lecture:

Chapter 2 Lecture - 30 Slides

Videos:

Schematic Diagrams & Symbols, Electrical Circuits - 17 Minutes

Understanding Blueprints: Electrical Symbols Explained - 19 Minutes

Assignment:

Electrical Symbol Quiz

Module 3

3.1 Module Overview

Concept Goals:

By the end of this week, you should:

- Demonstrate the ability to read a digital multi-meter (SLO 4)
- Identify the functions and uses of a digital multi-meter (SLO 4)
- Identify hand tools accurately (SLO 4)

Concept Content:

This week we will discuss test instruments and hand tools. See module 3.3 for more detail.

This Week At A Glance:

Reading:

Chapter 3 - Test Instruments - 28 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lecture:

Test Instruments - 42 Slides - This lecture goes right along with the textbook reading.

Hand Tools - 27 Slides - This lecture goes over basic hand tools a technician may use on the job. Also provides instructions on how to properly use them.

Assignments:

Module Review Quiz

Hand Tool Identification Work Sheet

Hand Tool Worksheet

3.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week, we will discuss test instruments and hand tools. Our discussions this week will include general safety rules, explanations on how to use digital multimeters, and explaining how various hand tools work among other topics.

This Week's Material:

Reading:

Chapter 3 - Test Instruments - 28 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lecture:

Test Instruments - 42 Slides - (Instructor Note: this lecture specifically goes with the textbook from above).

Hand Tools - 27 Slides - This lecture goes over basic hand tools a technician may use on the job. Also provides instructions on how to properly use them.

3.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignments:

Digital Multimeter Lab

Hand Tool Identification Work Sheet

Hand Tool Worksheet

Download and complete the hand tool worksheets and turn them in during class.

For the digital multimeter lab, we will work through the lessons/exercises in class. **(Instructor Note: there is an assessment of learning assignment that has students creating an instructional training video, you can choose to omit that assignment).**

3.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

3.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

3.6 Module Wrap-Up

Concept Goals:

Module Learning Objective:

- Demonstrate the ability to read a digital multi-meter (SLO 4)
- Identify the functions and uses of a digital multi-meter (SLO 4)
- Identify hand tools accurately (SLO 4)

Concept Content:

This week we discussed test instruments and hand tools. Next week we will look into electrical safety.

This Week In Review:

Reading:

Chapter 3 - Test Instruments - 28 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lecture:

Test Instruments - 42 Slides - This lecture goes right along with the textbook reading.

Hand Tools - 27 Slides - This lecture goes over basic hand tools a technician may use on the job. Also provides instructions on how to properly use them.

Assignments:

Module Review Quiz

Hand Tool Identification Work Sheet

Hand Tool Worksheet

Module 4

4.1 Moudle Overview

Concept Goals:

By the end if this week, you should:

- Describe what PPE is (SLO 4)

- Demonstrate the ability to do lockout/tagout (SLO 2)
- Describe what electric shock is and how to avoid it (SLO 4)

Concept Content:

This week we will look at electrical safety. See module 4.2 for more detail.

This Week At A Glance:

Reading:

Chapter 4 - Electrical Safety - 28 Slides

Lectures:

Electrical Safety - 37 Slides

Videos:

Lock Out Tag Out Training - 21 Minutes

Assignments:

Module Review Quiz - 10 Questions

Lockout/Tagout Lab

4.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will go over electrical safety. This will include general safety rules, lockout/tagout

procedures, fire safety, and more.

This Week's Material:

Reading:

Chapter 4 - Electrical Safety - 28 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Electrical Safety - 37 Slides - (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Lock Out Tag Out Training - 21 Minutes - This video provides a visual example to go along with what is discussed in the textbook and lecture. It also expands upon those concepts with more detailed explanations as to why the steps in Lock Out/Tag Out take place.

4.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Weeks Assignments:

Module Review Quiz - 10 Questions - Access the quiz but going to the assignments tab and look under quiz.

Lockout/Tagout Lab - We will walk through the steps of lockout/tagout as described in the book/video using the equipment in the lab.

Instructor Note: If your lab does not have equipment for Lockout/Tagout, ToolingU has a

great virtual lab simulation for Lockout/Tagout.

4.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

4.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

4.6 Module Wrap-Up

Concept Goals:

By the end if this week, you should:

- Describe what PPE is (SLO 4)
- Demonstrate the ability to do lockout/tagout (SLO 2)
- Describe what electric shock is and how to avoid it (SLO 4)

Concept Content:

This week we discussed electrical safety. Next week we will discuss control logic.

This Week At A Glance:

Reading:

Chapter 4 - Electrical Safety - 28 Slides

Lectures:

Electrical Safety - 37 Slides

Videos:

Lock Out Tag Out Training - 21 Minutes

Assignments:

Module Review Quiz - 10 Questions

Lockout/Tagout Lab

Module 5

5.1 Module Overview

Concept Goals:

By the end of this week, you will:

- Describe how circuit logic woks in various scenarios (SLO 4)
- Understand various functions of buttons in control circuits (SLO 4)
- Describe how to troubleshoot control circuits (SLO 4)
- Understand how to read line diagrams (SLO 3)

Concept Content:

This week we will discuss control logic. See module 5.2 for detail.

This Week At A Glance:

Reading:

Chapter 5 - Control Logic - 26 Slides

Lectures:

Control Logic - 55 Slides

Videos:

Control Relays - 26.5 Minutes

Assignment:

Module Review Quiz - 8 Questions

5.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will discuss control logic. We will discuss the basic rules of line diagrams, and go over logic functions, common control circuits, and how to troubleshoot those control circuits.

This Week's Material:

Reading:

Chapter 5 - Control Logic - 26 Slides

Lectures:

Control Logic - 55 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Control Relays - 26.5 Minutes - This video provides visual examples of the graphs we see in the lecture and expands upon how control relays work.

5.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignment:

Module Review Quiz - 8 Questions

5.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

5.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

5.6 Module Wrap-Up

Concept Goals:

Student Learning Outcomes:

- Describe how circuit logic woks in various scenarios (SLO 4)
- Understand various functions of buttons in control circuits (SLO 4)
- Describe how to troubleshoot control circuits (SLO 4)
- Understand how to read line diagrams (SLO 3)

Concept Content:

This week we discussed control logic. Next week we will discuss mechanical input control devices.

This Week In Review:

Reading:

Chapter 5 - Control Logic - 26 Slides

Lectures:

Control Logic - 55 Slides

Videos:

Control Relays - 26.5 Minutes

Assignment:

Module Review Quiz - 8 Questions

Module 6

6.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Describe how truth tables work (SLO 2)
- Understand how various industrial switches work (SLO 2)

- Understand what issues can arise when installing control devices (SLO 2)

Concept Content:

This week we will discuss mechanical input control devices. See module 6.2 for more detail.

This Week At A Glance:

Reading:

Chapter 6 - Mechanical Input Control Devices - 32 Slides

Sources: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Mechanical Input Control Devices - 59 Slides

Videos:

How It Works: Selector Switches - 2.5 Minutes

What is a Limit Switch - 1.5 Minutes

Pressure Switch Operating Principles - 2 Minutes

How Do Flow Switches Work - 1 Minute

Types of Level Switch - 5 Minutes

Assignment:

Module Review Quiz - 10 Questions

6.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will look over mechanical input control devices. We will talk about different types of switches from limit switches, to foot switches, to pressure switches and more. We will also talk about preventing problems when installing these control devices.

This Week's Material:

Reading:

Chapter 6 - Mechanical Input Control Devices - 32 Slides

Sources: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Mechanical Input Control Devices - 59 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

How It Works: Selector Switches - 2.5 Minutes

What is a Limit Switch - 1.5 Minutes

Pressure Switch Operating Principles - 2 Minutes

How Do Flow Switches Work - 1 Minute

Types of Level Switch - 5 Minutes

These videos are visual examples that expand upon some of the switches we discuss in our materials this week.

6.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignment:

Module Review Quiz - 10 Questions

6.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

6.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

6.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- Describe how truth tables work (SLO 2)
- Understand how various industrial switches work (SLO 2)
- Understand what issues can arise when installing control devices (SLO 2)

Concept Content:

This week we discussed mechanical input control devices. Next week we will discuss solenoids.

This Week In Review:

Reading:

Chapter 6 - Mechanical Input Control Devices - 32 Slides

Sources: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Mechanical Input Control Devices - 59 Slides

Videos:

How It Works: Selector Switches - 2.5 Minutes

What is a Limit Switch - 1.5 Minutes

Pressure Switch Operating Principles - 2 Minutes

How Do Flow Switches Work - 1 Minute

Types of Level Switch - 5 Minutes

Assignment:

Module Review Quiz - 10 Questions

Module 7

7.1 Module Overview

Concept Goals:

By the end of this week, you should:

- Accurately describe how relays work (SLO 1)
- Accurately describe the workings of electromagnets (SLO 4)
- Accurately describe the workings of solenoids (SLO 4)

Concept Content:

This week we will discuss solenoids. See module 7.2 for more detail.

This Week At A Glance:

Textbook:

Chapter 7 - Solenoids - 16 Slides

Lecture:

Chapter 7 - Solenoids Lecture - 32 Slides

Videos:

Solenoid Basics Explained - 9 Minutes

Inductors (Full Lecture) - 28.5 Minutes

Assignment:

Module Review Quiz - Questions

Relay Works Essay

7.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will discuss solenoids and briefly discuss inductors. Our topics will include electromagnets, the basics of solenoids, and how to troubleshoot solenoids.

This Week's Material:

Textbook:

Chapter 7 - Solenoids - 16 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lecture:

Chapter 7 - Solenoids Lecture - 32 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Solenoid Basics Explained - 9 Minutes

Inductors (Full Lecture) - 28.5 Minutes - This video is a good introduction to the topic of inductors. It compliments the materials discussed this week.

7.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignments:

Module Review Quiz - 10 Questions

Relay Works Essay - Write a short essay in Microsoft Word. In your own words, describe the simplicity and actual function of a relay within a seal in circuit. Include key component such as the coil of copper wire and how it interacts with the iron core, the spring and it's function, etc. Why are contacts important and how many are needed to actually work.

150 word minimum. Upload your completed essay in the assignments tab under quiz. It will be the 11th question.

7.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted

to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

7.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

7.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- Accurately describe how relays work (SLO 1)
- Accurately describe the workings of electromagnets (SLO 4)
- Accurately describe the workings of solenoids (SLO 4)

Concept Content:

This week we discussed solenoids. Next week we will have our mid-term exam.

This Week In Review:

Textbook:

Chapter 7 - Solenoids - 16 Slides

Lecture:

Chapter 7 - Solenoids Lecture - 32 Slides

Videos:

Solenoid Basics Explained - 9 Minutes

Inductors (Full Lecture) - 28.5 Minutes

Assignment:

Module Review Quiz - Questions

Relay Works Essay

Module 8

8.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Demonstrate understand of course material thus far

Concept Content:

This week we will have our mid-term exam. This exam will cover the material from the first seven weeks. To access the exam you will click on the assignments tab and click under test.

Mid-Term Exam - 35 Questions

8.2 Module Wrap-Up

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

Thank you for your work in the course thus far. We will start the second half of the course next week. Have a great rest of your week.

Module 9

9.1 Module Overview

Concept Goals:

By the end of this week, you will:

- Describe the process of checking transformer resistance (SLO 1)
- Understand transformers losses (SLO 1)
- Understand the differences between "H" and "X" markings on a transformer (SLO 1)

Concept Content:

This week we will go over transformers. See module 9.2 for more detail.

This Week At a Glance:

Reading:

Chapter 11 - Transformers - 12 Slides

History of Transformers - Webpage

Transformers Informational Packet - 25 Pages

Lectures:

Chapter 11 - Transformers - 23 Slides

Videos:

Introduction to Transformers – 40 Minutes

Assignment:

Module Review Quiz - 10 Questions

9.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will discuss transformers. This will include the history of transfomers, transformer theory, types of transformers, and how to troubleshoot transformers.

This Week's Material:

Reading:

Chapter 11 - Transformers - 12 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

History of Transformers - Webpage - This webpage gives a more expanded view on the development of transfomers. This can help understand where transfomer technology came from and why it is the way it is today.

Source: *The history of the Transformer*. History of Transformers. https://edisontechcenter.org/Transformers.html

Transformers Informational Packet - 25 Pages - This packet from the Department of Energy supplements this week's textbook reading.

Source: Department of Energy Fundamentals Series

Lectures:

Chapter 11 - Transformers - 23 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Introduction to Transformers – 40 Minutes

9.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignment:

Module Review Quiz - 10 Questions

9.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

9.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

9.6 Module Wrap-Up

Concept Goals:

By the end of this week, you will:

- Describe the process of checking transformer resistance (SLO 1)
- Understand transformers losses (SLO 1)
- Understand the differences between "H" and "X" markings on a transformer (SLO 1)

Concept Content:

This week we went over transformers. Next week we will discuss contactors and motor starters.

This Week In Review:

Reading:

Chapter 11 - Transformers - 12 Slides

History of Transformers - Webpage

Transformers Informational Packet - 25 Pages

Lectures:

Chapter 11 - Transformers - 23 Slides

Videos:

Introduction to Transformers – 40 Minutes

Assignment:

Module Review Quiz - 10 Questions

Module 10

10.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Describe how magnetic motor starters work (SLO 1)
- Understand what types of switches would be used in what situations (SLO 1)
- Describe the differences between a starter and a contactor (SLO 1)

Concept Content:

This week we will go over contactors and magnetic motor starters. See module 10.2 for more detail.

This Week At A Glance:

Reading:

Chapter 12 - Contactors and Magnetic Motor Starters - 36 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Contactors and Magnetic Motor Starters - 64 Slides

Videos:

Control Relays Lecture - 26.5 Minutes

Contactors Lecture - 29 Minutes

Overloads Relays Lecture - 12 Minutes

Assignment:

Module Review Quiz - 10 Questions

10.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will discuss contactors and magnetic starters. This will include material on relays, how to modify motor starters and how to troubleshoot both contactors and motor starters.

This Week's Material:

Reading:

Chapter 12 - Contactors and Magnetic Motor Starters - 29 Slides

Chapter 12 Part 2 - Contactors and Magnetic Motor Starters - 7 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Contactors and Magnetic Motor Starters - 64 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Control Relays Lecture - 26.5 Minutes

Contactors Lecture - 29 Minutes

Overloads Relays Lecture - 12 Minutes

These videos expand upon concepts discussed in this week's textbook and lecture.

10.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignment:

Module Review Quiz - 10 Questions

10.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

10.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

10.6 Module Wrap-Up

Concept Goals:

By the end of this module, you should:

- Describe how magnetic motor starters work (SLO 1)
- Understand what types of switches would be used in what situations (SLO 1)
- Describe the differences between a starter and a contactor (SLO 1)

Concept Content:

This week we went over contactors and magnetic motor starters. Next week we will look over DC Motors.

This Week In Review:

Reading:

Chapter 12 - Contactors and Magnetic Motor Starters - 36 Slides

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lectures:

Contactors and Magnetic Motor Starters - 64 Slides

Videos:

Control Relays Lecture - 26.5 Minutes

Contactors Lecture - 29 Minutes

Overloads Relays Lecture - 12 Minutes

Assignment:

Module Review Quiz - 10 Questions

Module 11

11.1 Module Overview

Concept Goals:

By the end of this module you will:

- Wire a DC motor to specifications (SLO 1)
- Correctly describe the parts of a DC moto (SLO 1)

Concept Content:

This week we will discuss DC motors. See module 11.2 for more detail.

This Week At A Glance:

Reading:

Chapter 13 - DC Motors - 24 Pages

4 Types of DC Motors: In Introduction - Webpage

Lectures:

DC Motors - 43 Slides

Videos:

Motor Family Tree - 34 Minutes

How do DC Motors Work - 10 Minutes

Assignments:

Module Review Quiz - Questions

DC Motors In Class Assignment

11.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will discuss DC motors. This will include an overview of DC motor types, DC motor operation, DC motor construction, and troubleshooting DC motors.

This Week's Material:

Reading:

Chapter 13 - DC Motors - 24 Pages

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

4 Types of DC Motors: In Introduction - Webpage

Source: 07/05/2017, A. M. T. |. (n.d.). *4 types of DC Motors: An introduction*. Automate. https://www.automate.org/motion-control/blogs/4-types-of-dc-motors-an-introduction

Lectures:

DC Motors - 43 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Motor Family Tree - 34 Minutes

How do DC Motors Work - 10 Minutes

Both of these videos expand upon the textbook material for this week.

11.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignments:

Module Review Quiz - 10 Questions

DC Motors In Class Assignment

Download the worksheet. We will complete the worksheet using equipment we have in class.

11.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

11.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

11.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- Wire a DC motor to specifications (SLO 1)
- Correctly describe the parts of a DC moto (SLO 1)

Concept Content:

This week we discussed DC motors. Next week we will start AC motors.

This Week In Review:

Reading:

Chapter 13 - DC Motors - 24 Pages

4 Types of DC Motors: In Introduction - Webpage

Lectures:

DC Motors - 43 Slides

Videos:

Motor Family Tree - 34 Minutes

How do DC Motors Work - 10 Minutes

Assignments:

Module Review Quiz - 10 Questions

DC Motors In Class Assignment

Module 12

12.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Wire an AC motor to specifications (SLO 1)
- Correctly describe the parts of a AC motor (SLO 1)

Concept Content:

This week we will discuss AC Motors. See module 12.2 for more details.

This Week At A Glance:

Reading:

Chapter 14 - AC Motors - 26 Pages

AC Motor: What Is It - Webpage.

Lectures:

AC Motors - 38 Slides

Videos:

Introduction to 3 Phase AC Systems - 46.5 Minutes

Motor Connection Diagrams - 28 Minutes

This Week's Assignments:

Module Review Quiz - 10 Questions

AC Motor Worksheet

12.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will discuss AC motors. Topics include the types of AC motors, how to maintain AC motors, and how to troubleshoot.

This Week's Material:

Reading:

Chapter 14 - AC Motors - 26 Pages

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

AC Motor: What Is It - Webpage. This webpage provides a great overview with visuals of the concepts from the textbook.

Source: Industrial Quick Search. (n.d.). *Industrial Quick Search*. AC Motor: What Is It? How Does It Work? Types & Uses. https://www.iqsdirectory.com/articles/electric-motor/ac-motor.html

Lectures:

AC Motors - 38 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Introduction to 3 Phase AC Systems - 46.5 Minutes

Motor Connection Diagrams - 28 Minutes

12.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignments:

Module Review Quiz - 10 Questions

AC Motor Worksheet

Download the worksheet and we will work on it in class.

12.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

12.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

12.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- Wire an AC motor to specifications (SLO 1)
- Correctly describe the parts of a AC motor (SLO 1)

Concept Content:

This week we discussed AC Motors. Next week we will discuss reversing motors.

This Week In Review:

Reading:

Chapter 14 - AC Motors - 26 Pages

AC Motor: What Is It - Webpage.

Lectures:

AC Motors - 38 Slides

Videos:

Introduction to 3 Phase AC Systems - 46.5 Minutes

Motor Connection Diagrams - 28 Minutes

This Week's Assignments:

Module Review Quiz - 10 Questions

AC Motor Worksheet

Module 13

13.1 Module Overview

Concept Goals:

By the end of this module, you will:

- Wire a three phase motor (SLO 1)
- Describe various methods for fixing/troubleshooting reversing motors (SLO 1)

Concept Content:

This week we will cover reversing motors. See module 13.2 for more details.

This Week At A Glance:

Reading:

Chapter 15 - Reversing Motors - 24 Pages

How to Reverse an AC Motor - Webpage

Lectures:

Reversing Motors- 43 Slides

Videos:

Reversing Motor Starters with Interlocks Full Lecture – 22.5 Minutes

Assignments:

Module Review Quiz - Questions

3 Phase Motors Assignment

13.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will talk about reversing motors. We will cover manual starters, drum starters, magnetic starters and how to troubleshoot reversing power circuits.

This Week's Material:

Reading:

Chapter 15 - Reversing Motors - 24 Pages

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

How to Reverse an AC Motor - Webpage - This provides a good summary/overview of this week's material from an industry perspective.

Source: Nagel, H. (2022, January 20). *How to reverse AC Motors*. Groschopp. https://www.groschopp.com/how-to-reverse-ac-motors/

Lectures:

Reversing Motors- 43 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Reversing Motor Starters with Interlocks Full Lecture – 22.5 Minutes

13.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignments:

Module Review Quiz - 10 Questions

3 Phase Motors Assignment

Download the motors assignment worksheet. We will work on it in class.

13.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

13.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

13.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- Wire a three phase motor (SLO 1)
- Describe various methods for fixing/troubleshooting reversing motors (SLO 1)

Concept Content:

This week we covered reversing motors. Next week we will discuss motor drives.

This Week In Review:

Reading:

Chapter 15 - Reversing Motors - 24 Pages

How to Reverse an AC Motor - Webpage

Lectures:

Reversing Motors- 43 Slides

Videos:

Reversing Motor Starters with Interlocks Full Lecture – 22.5 Minutes

Assignments:

Module Review Quiz - 10 Questions

3 Phase Motors Assignment

Module 14

14.1 Module Overview

Concept Goals:

By the end of this module, you should:

- Define and describe motor drives (SLO 1)

Concept Content:

This week we will look over motor drives. See module 14.2 for more details.

This Week At A Glance:

Reading:

Chapter 26 - Motor Drives - 28 Pages

Chapter 26 Part 2 - Motor Drives - 12 Pages

Lecture:

Motor Drives Lecture - 55 Slides

Videos:

Motor Drives – 43 Minutes

Motor Drive Deceleration and Braking Methods - 11 Minutes

Motor Drive Deceleration and Breaking Methods 2 – 12 Minutes

Assignment:

Module Review Quiz - 10 Questions

14.2 Module Content Resources

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This week we will cover motor drives. We will look over the construction of motor drives, how to program them, and the differences between DC and AC motor drives.

This Week's Content:

Reading:

Chapter 26 - Motor Drives - 28 Pages

Chapter 26 Part 2 - Motor Drives - 12 Pages

Source: Rockis, G. J., & Mazur, G. A. (2014). *Electrical Motor Controls for Intergrated Systems* (5th ed.). American Technical Publishers.

Lecture:

Motor Drives Lecture - 55 Slides (Instructor Note: this lecture specifically goes with the textbook from above).

Videos:

Motor Drives – 43 Minutes

Motor Drive Deceleration and Braking Methods - 11 Minutes

Motor Drive Deceleration and Breaking Methods 2 – 12 Minutes

14.3 Module Assessment/Assignment

Concept Goals:

Outline the learning goals for this module here.

Concept Content:

This Week's Assignment:

Module Review Quiz - 10 Questions

14.4 Module Reflection

Concept Content:

This is a completely optional section. The purpose of this section is to ask your students to reflect on the material they have learned in this course. Or, if there is a specific area of the content you wanted to make sure students understood, you could guide them to discuss that in their response to your reflection question(s). You could also use this section to discuss case studies related to the content this section went over. However, if you feel that this would not be an appropriate assignment/task for your specific subject, please feel free to delete this section from your class.

14.5 Module Discussion Board

Concept Content:

This is a completely optional section. The purpose of this section is to invite your students to discuss the week's content and what they learned from it with each other. If you feel this would not be appropriate for your class or at least this week's content, feel free to delete it. If you are interested in doing a discussion board, a good idea would be to come up with a question related to the week's content for the students to answer. From there, require them to answer the quesion and respond to a least one other student's answer to foster discussion.

14.6 Module Wrap-Up

Concept Goals:

Module Learning Objectives:

- Define and describe motor drives (SLO 1)

Concept Content:

This week we looked over motor drives. Next week we will have our final exam.

This Week In Review:

Reading:

Chapter 26 - Motor Drives - 28 Pages

Chapter 26 Part 2 - Motor Drives - 12 Pages

Lecture:

Motor Drives Lecture - 55 Slides

Videos:

Motor Drives – 43 Minutes

Motor Drive Deceleration and Braking Methods - 11 Minutes

Motor Drive Deceleration and Breaking Methods 2 – 12 Minutes

Assignment:

Module Review Quiz - 10 Questions

Module 15 - Final Exam

15.1 Final Exam

Concept Goals:

By the end of this module, you should:

- Demonstrate an understanding of course material

Concept Content:

This week we will take our final exam? To access the quiz click on the assignments tab and look under test.

Final Exam - 50 Questions

15.2 Course Wrap-Up

Concept Content:

Thank you for all of your work this semester. Best of luck on the rest of your studies.

Faculty Resources (For Instructor Only, Do Not Publish Live)

Odigia Guide

Concept Content:

Click on the resources tab to find the guide sheet for instructors.

Module 3 Worksheet Answer Keys

Concept Content:

The answer keys to both worksheets are here.

Hand Tool Identification Worksheet Answer Key

Basic Hand Tool Worksheet Answer key