



## Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: <https://catalog.uvu.edu/>

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**Semester:** Spring

**Course Prefix:** AET

**Course Title:** Industrial Electric Code

**Year:** 2025

**Course and Section #:** 1250 X01

**Credits:** 2

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### ***Course Description***

Covers National Electrical Code and International Electrical Code using electrical prints, installation methods, and system requirements in mechatronic systems. Covers the creation and use of electrical diagrams for design and troubleshooting.

This course is required for both the Associates degree and Bachelor's degree in Mechatronics Engineering Technology. This course provides the framework and fundamentals for being successful throughout the Mechatronics program.

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### ***Course Attributes***

This course has the following attributes:

- ☐ General Education Requirements
- ☐ Global/Intercultural Graduation Requirements
- ☐ Writing Enriched Graduation Requirements
- ☒ Discipline Core Requirements in Program
- ☐ Elective Core Requirements in Program
- ☐ Open Elective

Other: *Click here to enter text.*

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### ***Instructor Information***

**Instructor Name:** Beau Freckleton

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### ***Student Learning Outcomes***

1. Utilize the National Electrical Code and International Electrical Code to make design decisions in mechatronic systems
2. Calculate sizing the load and size of electrical mechatronic circuits and equipment
3. Specify mechatronic electrical equipment integrated into a system for an application
4. Create electrical diagrams using industry standards
5. Interpret Use electrical symbols, plans, and schematics diagrams to troubleshoot a mechatronic system
6. Analyze engineering electrical specifications
7. Identify proper grounding techniques
8. Identify NEC commercial and industrial code requirements

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## ***Course Materials and Texts***

### **Textbooks and Course Material**

- Required Textbook: Ugly's Electrical Reference 2023, Jones & Bartlett Learning, 978-1-284-27591-9
  - The textbook is available from the UVU Bookstore or online merchants.
  - A physical copy of the textbook is available for 2 hour checkout at the library.
- Required: Access to a computer and reliable internet connection - Create an account for the National Electric Code, NFPA 70
  - <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=70>[Links to an external site.](#)
  - A physical copy of the code-book is available for 2 hour checkout at the library.
- Recommended Textbook: Illustrated Guide to the National Electrical Code, 9th edition, Charles R. Miller, 978-0-357-76680-4
  - The textbook is available from online merchants and a copy will be on reserve at the library.
  - Although not required the book has excellent additional practice exercises and insights on the topics covered in this course.

### **Technology Tools**

- In this course, you are encouraged to use the library's resources and services. The library provides access to books, articles, videos, and other materials. Librarians can help you find resources, help with search strategies, identify the best resources, develop citations, and more. Help is available via [email, phone, online chat, in-person, or by appointment](#)[Links to an external site.](#). You can learn more about the library at <https://www.uvu.edu/library/>[Links to an external site.](#)
- Here is a link to the Mechatronics Library Guides for further reading.
  - <https://uvu.libguides.com/mechatronics>[Links to an external site.](#)

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## ***Course Requirements***

### **Course Assignments, Assessments, and Grading Policy**

- Homework (Quizzes): Weekly questions related to topics under study.
  - Homework (Discussions): Assignment to post thoughts and responses on topics under study.
  - Homework (Assignments): Assignment to update settings on course software.
  - Final Exam: A comprehensive exam that covers all course topics.
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- Homework: 70% of overall grade
  - Final Exam: 30% of overall grade

A	100% to 94%
A-	< 94% to 90%
B+	< 90% to 87%
B	< 87% to 84%
B-	< 84% to 80%
C+	< 80% to 77%
C	< 77% to 74%
C-	< 74% to 70%
D+	< 70% to 67%
D	< 67% to 64%
D-	< 64% to 61%
F	< 61% to 0%

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### **Required or Recommended Reading Assignments**

All required readings use chapters from the course text that align with the lectures below

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### **General Description of the Subject Matter of Each Lecture or Discussion**

- 1.1 Course Introduction, syllabus, software usage settings, and class introduction
  - 2.1 Introduction to National Electric Code
  - 2.2 Grounding, Grounded Neutral, Working Space
  - 3.1 Ampacity and Breakers
  - 4.1 Wire Terminations
  - 5.1 Wire Sizing
  - 5.2 Wire Ampacity Adjustments
  - 6.1 Voltage Drop
  - 6.2 Wire Installation
  - 7.1 Box Fill
  - 8.1 Motor Protection Part 1
  - 8.2 Motor Protection Part 2
  - 9.1 Motor Protection Part 3
  - 10.1 Transformer Protection
  - 10.2 Installation Specifications
  - 11.1 Circuit Schematics and Symbology
  - 12.1 Motor Control Circuit
  - 13.1 HOA Circuit Control
  - 14.1 PLC Part 1
  - 15.1 PLC Part 2
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### ***Required Course Syllabus Statements***

#### **Generative AI**

AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to develop your own individual

voice. At the same time, you should learn how to use AI and in what instances AI can be helpful to you.

This course requires you to complete assignments that assess your understanding and application of the material. You are expected to do your own work, and the use of artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, is strongly discouraged for any part of your assignments. If you have questions about acceptable use of AI tools, please consult the instructor before submitting your work.

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### **Using Remote Testing Software**

☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

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## ***Required University Syllabus Statements***

### **Accommodations/Students with Disabilities**

Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU [Accessibility Services](#) at [accessibilityservices@uvu.edu](mailto:accessibilityservices@uvu.edu) or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at [DHHservices@uvu.edu](mailto:DHHservices@uvu.edu)

DHH is located on the Orem Campus in BA 112.

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### **Academic Integrity**

At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their [rights and responsibilities](#). In each course, they are responsible for knowing the requirements and restrictions regarding research and

writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in [UVU Policy 541: \*Student Code of Conduct\*](#).

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### **Equity and Title IX**

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – [TitleIX@uvu.edu](mailto:TitleIX@uvu.edu) – 800 W University Pkwy, Orem, 84058, Suite BA 203.

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### **Religious Accommodation**

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.

To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at [accessibilityservices@uvu.edu](mailto:accessibilityservices@uvu.edu). If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a [specially dedicated space](#) for meditation, prayer, reflection, or other forms of religious expression.