



## 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 Logic

**Year:** 2025

**Course and Section #:** 1150-601

**Credits:** 1

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### *Course Description*

Introduces digital logic and relay logic theory and industrial applications of logic circuits. Discusses numbering systems, boolean algebra, circuit simplification techniques, and logic devices such as latches, one-shots, timers, counters, flip flops, and shift registers. Emphasizes the relationship between ladder logic and digital logic and focuses on conversion between both formats. Discusses application and troubleshooting of logic circuits and introduces basic concepts of state machines

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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:** Travis Fraughton - Lecturer

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### *Student Learning Outcomes*

1	Discuss safe work and design practices.
2	Solve problems utilizing Boolean algebra.
3	Convert conventional relay logic to digital logic and vice versa.
4	Design logic circuits to complete a process.
5	Describe the operation of basic logic devices and gates.
6	Describe troubleshooting techniques on industrial logic circuits.

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

Calculator

Digital Fundamentals, Floyd 11<sup>th</sup> Edition

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## ***Course Requirements***

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

Chapter Exams (40% of overall grade)

Attendance (25% of overall grade)

Final Exam (35% of overall grade)

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

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

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

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

Chapter 1: Introductory Concepts

Digital and Analog Quantities, Binary Digits, Logic Levels, Digital Waveforms, Basic Logic Functions

Chapter 2: Number Systems, Operations and Codes

Decimal, Binary, Octal and Hexadecimal numbers, Complements of Binary Numbers, Arithmetic Operations with Signed Numbers

Chapter 3: Logic Gates

Inverter, And Gate, Or Gate, NAND Gate, NOR Gate, Exclusive-OR and Exclusive-Nor Gate

Chapter 4: Boolean Algebra and Logic Simplification

Boolean Operations and Expressions, Laws and Rules of Boolean Algebra, DeMorgan's Theorems, Logic Simplification, Karnaugh Map SOP Minimization

Chapter 5: Combinational Logic Analysis

Basic Combinational Logic Circuits, Implementing Combinational Logic, Universal Property of NAND and NOR Gates

Chapter 6: Functions of Combinational Logic

Half and Full Adders, Parallel Binary Adders, Comparators,

Chapter 7: Latches Flip-Flops, and Timers

Latches, Flip-Flops

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## Chapter 8: Shift Registers

Shift Register Operations, Types of Shift Registers, Bidirectional Shift Registers, Shift Register Counters

## Chapter 9: Counters

Asynchronous Counters, Synchronous Counters, Up/Down Synchronous Counters

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## ***Required Course Syllabus Statements***

### **Generative AI**

AI - Use ChatGPT as a learning assistant, not as a crutch. If you use it, cite it at the top of your homework or assignment. Don't accept anything it generates at face value without checking it critically. If it helps you learn some things faster, GREAT!. Just remember: If you REALLY want to be good, work for it.

**You may not use AI on tests or quizzes.**

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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.

## **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.