AET 1060 Course Syllabus

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

Semester: Spring
Year: 2025
Course Prefix: AET
Course and Section #: 1060-001
Course Title: Electrical Math II
Credits: 3

Course Description

Utilizes algebraic formulas and methods to solve electrical problems related to AC electrical systems. Covers the calculation of voltage, current, resistance, reactance, impedance, power, VARs, volt-amperes and efficiency for single phase and three phase AC systems. Applies trigonometry, trigonometric functions, complex numbers, and phasors to circuit analysis techniques. Analyzes sine waves, transformers, transformer connections and power factor for single phase and three phase electrical systems. Introduces three phase balanced systems and faults.

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.*

Instructor Information

Instructor Name: Ken Workman

Student Learning Outcomes

	Upon successful completion, students should be able to . . .
1	Solve algebraic problems related to the electrical industry.
2	Analyze AC circuits using trigonometry, trigonometric identities, vectors, complex numbers, and phasors.
3	Solve series, parallel, and combination circuits using standard circuit analysis techniques.
4	Calculate true, reactive, and apparent power, and power factor for inductive and capacitive electrical systems.

5	Use algebraic methods to solve electrical problems involving exponential, logarithmic, polynomial and rational functions, and systems of equations related to AC electrical systems.
6	Analyze single phase and three phase power systems and transformers.
7	Graph linear and nonlinear electrical functions.

Course Materials and Texts

Required Textbook:

- Title: Mathematics for Electricity and Electronics
- Edition: 4th
- Author: Kramer
- ISBN: 9781111545079
- ISBN: 9781133707530 (eBook if you prefer)

Required Scientific Calculator w / Trig Functions (sin, cos, tan)

- TI-36X Pro (**Required**)

Course Requirements

Grading Scale:

The following grading standards will be used in this class (you must get a c- or better in the class to pass. A "D" is NOT considered passing any CORE class in the Electrical & Control Technology certificate, Automation and Electrical Technology program, or Mechatronics Engineering Technology program.

Grade	Range
A	**100 % to 94.0%**
A-	**< 94.0 % to 90.0%**
B+	**< 90.0 % to 87.0%**
B	**< 87.0 % to 84.0%**
B-	**< 84.0 % to 80.0%**
C+	**< 80.0 % to 77.0%**
C	**< 77.0 % to 74.0%**
C-	**< 74.0 % to 70.0%**
D+	**< 70.0 % to 67.0%**
D	**< 67.0 % to 64.0%**
D-	**< 64.0 % to 61.0%**
F	**< 61.0 % to 0.0%**

Assignment Categories:

Activity	Percentage/Points
Homework	**15%**

Quizzes / Reflections / Misc.	**25%**
Chapter Exams	**40%**
Final Exam	**20%**

Course Assignments, Assessments, and Grading Policy

Homework:

Homework will be given for each chapter (from the textbook or other resources) and will be due as stated in CANVAS. Homework will be required to be submitted as a pdf document. Grading of homework will be very simplistic and almost binary in nature **(100% for completion and work shown, 50% for little to no work shown, or 0% for no submission).** Homework submissions that are difficult to read and find solutions will be marked at either 0% or 50%. Late assignments submitted after the due date will automatically **RECEIVE A SCORE of 0%.** Only under a rare and **APPROVED ABSENCE** with documented email communication between you and your professor will credit be given. Half of the homework will be graded based on showing your work. If only the final answers are shown, the student will receive an **AUTOMATIC 50%**. Typically if all problems are complete and work is shown, a score of 100% will be given on a particular assignment regardless of whether or not each problem has the correct solution. Homework is for **YOUR BENEFIT AND YOUR EXAM PREPARATION.** It is not so much for the instructor to gauge whether or not you understand or have mastered the material.

To obtain homework feedback, answers to your questions, and correct solutions as needed, you will need to attend the appointed on-campus class time each week. By pacing yourself early on, you will have ample time to complete your homework so please don't make it a habit to ask if you can submit late work. It has been spelled out for you here in the syllabus.

Quizzes / Attendance:

Online participation (CANVAS) quizzes will be offered quite regularly and are NOT allowed to be made up without written pre-approval from your instructor. The quizzes will not be available to take after the due date. The quizzes will mainly assess understanding of the lecture videos and help the instructor know what concepts are not being grasped. Quizzes are meant to be an aid to the learning process and are worth a fourth of your final grad in the course. Some quizzes may allow for more than one attempt. In those cases, the system will keep your highest score. Quizzes may also be timed. You can best prepare for quizzes by understanding the examples and content explained in the lecture videos (**take the videos seriously**). Take notes while watching the videos (pdf notes download available for each video). You may use your course notes and text book on the quizzes unless otherwise stated.

Chapter Exams:

These remotely proctored (Links to an external site.) exams will only be allowed to be made up if you have an approved absence that has been approved by the instructor via CANVAS email communication. You will need a webcam for the remote proctoring. Please note that the exams are a large percentage of your course grade. The class examples in the module videos, quizzes, textbook, and homework assignments will all help best prepare you for the exams. Also pay attention to the discussion boards with exam topics.

Final Exam:

The final exam will be at the end of the semester during finals week. There will be flexibility during finals on which day you decide to take the final. It will be remotely proctoredLinks to an external site. in CANVAS and will not be allowed to be taken prior to finals week. Coordinate your schedule early to accommodate this exam on a day of your choice during finals week. The exam will be comprehensive.

Required or Recommended Reading Assignments
N/A

General Description of the Subject Matter of Each Lecture or Discussion
Week 1 – **Trigonometry Applied to AC Systems (Chapters 16, 17)**
Week 2 – **Trigonometric Functions & AC Systems (Chapters 18)**
Week 3 – **Trigonometry of Vectors and RL Circuits (Chapters 19-22)**
Week 4 – **Complex Numbers & Phasors Applied to Series RL Circuits (Chapter 20)**
Week 5 – **Parallel RL Circuit Example, Intro to AC Power**
Week 6 – **Intro to Capacitors, Parallel RC Circuits**
Week 7 – **Series & Parallel RLC Circuits (Chapter 21)**
Week 8 – **Single Phase Applications of Inductors and Capacitors (Chapter 22)**
Week 9 – **Single Phase Transformers**
Week 10 – **Balanced Three Phase Electrical Systems - WYE Configuration**
Week 11 – **Balanced Three Phase Electrical Systems - Delta Configuration**
Week 12 – **Single & Three Phase Power**
Week 13 – **Three Phase Transformers & Power**

Required Course Syllabus Statements

Generative AI
Generative AI has revolutionized communication in the same way that calculators transformed mathematics. Students are encouraged to leverage Generative AI to enhance their learning, creativity, and productivity. However, it is crucial for students to have a solid understanding of the course material to discern when Generative AI might provide inaccurate or misleading information. While Generative AI can be a valuable resource, it should be used as a supplementary tool rather than a replacement for your own critical thinking and knowledge. If you choose to use Generative AI, please document its use and critically evaluate the output. This practice will not only help you learn more effectively but also ensure academic integrity.

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.

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 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

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*.

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 – 800 W University Pkwy, Orem, 84058, Suite BA 203.

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. 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.