Master 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: EGDT 1600
Course and Section #: 1600-x01
Course Title: Technical Math Algebra
Credits: 3

Course Description

Covers the basic principles of algebra, geometry, and trigonometry as they relate to problem solving on the job. Includes solving equations, percent, proportion, variation, calculator operations, measurements, formula rearrangement, functions and graphs, and solving right and oblique triangles.

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: Jeffrey T. Johnson

Student Learning Outcomes

1. Correctly solve mathematical problems related to a particular field.
2. Apply data from technical publications in the solution of problems, such as, The Machinery's Handbook

Course Materials and Texts

Technical Mathematics I – McHale/ Witzke

Course Requirements

Course Assignments, Assessments, and Grading Policy

- Homework Quizzes: Each week, students will complete homework assignments through Canvas Quizzes that will test their understanding of each subject (60% of final grade).
- Exams: At the end of each chapter, students will complete an online exam on Canvas proctored through Proctorio. At the end of the semester, there will be a comprehensive exam. All exams will count equally towards the student's final grade (40% of final grade).

A	94 - 100%	B-	80 – 82.9%	D+	67 – 69.9%
A-	90 – 93.9%	C+	77 – 79.9%	D	63 – 66.9%
B+	87 – 89.9%	C	73 – 76.9%	D-	60 – 62.9%
B	83 – 86.9%	C-	70 – 72.9%	F	0 – 59.9%

Required or Recommended Reading Assignments
NA

General Description of the Subject Matter of Each Lecture or Discussion

- Module 1
  - Real numbers, order and absolute value, addition and subtraction, multiplication and division, operations with zero, properties of addition and multiplication, integral exponents.
- Module 2
  - Laws of exponents, powers of ten, scientific notation, order of operations, translating phrases to algebraic expressions, evaluating algebraic expressions as formulas.
- Module 3
  - The addition axiom, the multiplication axiom, using both axioms, the distributive principle, combining like terms, equations with like terms on opposite sides.
- Module 4
  - Removing grouping symbols, equations with grouping symbols, square roots, pure quadratic equations, applied problems involving formulas, other applied problems.
- Module 5
  - Exam 1
- Module 6
  - Equations containing one fraction, fractions containing an instance of the distributive principle, equations with two terms on one side, proportions, other equations containing two or more fractions.
- Module 7
  - Applied problems involving fractions, other applied problems, place names and word names, rounding.
- Module 8
  - Converting percent to fractions and decimals, converting decimals and fractions to percent, the three types of percent problems, applied problems involving percent
- Module 9
  - Ratio and proportions, cross-multiplication and proportions, applied problems involving rations and proportions, direct variation, inverse variation, quadratic variation, joint and combined variation.
- Module 10
  - Exam 2
- Module 11
  - English system, metric system, English-metric conversions, rates, temperature, metric prefixes and powers of ten, the decimal number system and powers of ten, metric conversions involving larger and smaller numbers.

- Module 12
    - Precision, limits and absolute error, significant digits, relative error and accuracy, operations with measurements.
- Module 13
    - Exam 3
- Module 14
    - Plane figures, similar triangles, perimeter of plane figures, area of plane figures, composite figures, units of area, volume of right prisms, units of volume, volume of other solids, surface area, density.
- Module 15
    - Multiplication, reducing to lowest terms, cancelling to reduce to lowest terms, reciprocals and division, addition and subtraction with like denominators, equivalent forms, finding lowest common denominators, addition and subtraction with unlike denominators.
- Module 16
    - Adding and subtracting a fraction and non-fraction, equivalent forms for sums and differences, contrasting two patterns, the distributive principle, reducing patterns to lowest terms, cancelling to reduce patterns to lowest terms, complex fractions.
- Module 17
    - Exam 4
- Module 18
    - Formula rearrangement, terms and coefficients, the multiplication axiom, fractional formulas, the square root principle, additive inverses and addition-subtraction conversions, the addition axiom, the inverse principle, multiplying by the distributive principle, another method and equivalent forms of solutions, factoring by the distributive principle.
- Module 19
    - A preferred form for fractional solutions, distributive-principal terms, distributive-principal denominators, linear equations, the coordinate system, graphing linear equations.
- Module 20
    - Slope of a line, slope-intercept form, graphing non-linear equations, graph formulas, functions.
- Module 21
    - Exam 5
- Module 22
    - The angle-sum principle for triangles, labeling angles and sides in triangles, the Pythagorean theorem, isosceles and equilateral triangles, the tangent ratio, the sine ratio, the cosine ratio, contrasting the basic trigonometric ratios.
- Module 23
    - Finding unknown sides in right triangles, finding unknown angles in right triangles, applied problems, oblique triangles, right-triangle methods and oblique triangles, the law of sines, using the law of sines to find sides, using the law of sines to find angles
- Module 24
    - Limitations of the law of sines, the law of cosines, using the law of cosines to find sides and angles, obtuse angles and the law of sines, obtuse angles and the law of cosines, strategies for solving triangles, applied problems.
- Module 25

    - Exam 6
- Module 26
    - The graphing method, the addition method, multiplication in the addition method, converting to standard form, decimal coefficients, the substitution method.
- Module 27
    - Applied problems, more applied problems, systems of formulas and formula derivation, the substitution method and formula derivation, the equivalence method and formula derivation.
- Final Exam

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.

The use of generative AI tools (e.g. ChatGPT, Google Gemini, etc.) is permitted in this course for the following activities:

- Questions regarding software
- Finding information on related topics

The use of generative AI tools is not permitted in this course for the following activities:

- Producing Drawings
- Impersonating you in classroom contexts, such as by using the tool to compose discussion board prompts/responses assigned to you or content that you put into a Teams/Canvas chat.

You are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contain misinformation or unethical content). Your use of AI tools must be properly documented and cited in order to stay within university policies on academic honesty.

Any student work submitted using AI tools should clearly indicate what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, please reach out to me for a conversation before submitting your work.

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.