

**Bluefield State University
Spring 2024**

Title and Course Number:

Technical Mathematics I, GNET 115

Professor:

Dr. Shannon R. Bowling

Office:

Room 216 - Dickason Hall

Office Hours:

See the attached office hours sheet

Contact Information:

Telephone: (304) 327-4131 (office)

Google Voice: (276) 243-1026 (allows you to contact me when I am not in the office)

Email: sbowling@bluefieldstate.edu

Credits and Contact Hours:

Online - Four (4) hours credits

Course Description:

A study of algebraic concepts & operations, functions & graphs, trigonometric functions & graphs, linear equations & determinants, factoring, fractions, vectors & triangles.

Prerequisites:

N/A

Textbook:

Basic Technical Mathematics with Calculus, 12th edition. ISBN-13: 9780137582846

[URL to Textbook](#)

Computer usage:

This course will utilize Moodle as a Learning Management System (LMS) and students are expected to have access to a computer and Internet connection. Various lecture notes, handouts, video lectures, etc. will be posted and students are expected to access these materials using the LMS.

Requirements:

A BSC email account will be required to access the materials that will be posted throughout the course. All class communication will be conducted using the BSC account.

Learning Outcomes by Chapter:

Chapter 1 - Basic Algebraic Operations

1. Identify real, imaginary, rational, and irrational numbers.
2. Perform mathematical operations on integers, decimals, fractions, and radicals.
3. Use the fundamental laws of algebra in numeric and algebraic expressions.
4. Employ mathematical order of operations.
5. Understand technical measurement, approximation, the use of significant digits, and rounding.
6. Use scientific and engineering notations.
7. Convert units of measurement.
8. Rearrange and solve basic algebraic equations.
9. Interpret word problems using algebraic symbols.

Chapter 2 - Geometry

1. Identify perpendicular and parallel lines.
2. Identify supplementary, complementary, vertical, and corresponding angles.
3. Determine interior angles and sides of various triangles.
4. Use the Pythagorean theorem.
5. Identify and analyze different types of quadrilaterals and polygons.
6. Identify and analyze circles, arcs, and interior angles of a circle.
7. Calculate the area and perimeter of a geometric shape.
8. Use an approximation method to estimate an irregular area.
9. Identify and analyze three-dimensional geometric figures, including volume, surface area, and dimensions.

Chapter 3 - Functions and Graphs

1. Define a function and distinguish between dependent and independent variables.
2. Use mathematical function notation.
3. Interpret a function as a process.
4. Determine the domain and range for a function.
5. Graph a function using the rectangular coordinate system.
6. Use a graphing calculator to solve an equation graphically.
7. Graph and interpret sets of data values.

Chapter 4 – The Trigonometric Functions

1. Define positive and negative angles.
2. Express an angle in degrees or radians and convert between the two measurements.
3. Determine a standard position angle.
4. Define, evaluate, and use the six trigonometric functions to solve a right triangle.
5. Use the Pythagorean theorem and trigonometric function to solve for a missing angle.
6. Solve application problems involving right triangles.

Chapter 5 – Systems of Linear Equations: Determinants

1. Identify linear equations.
2. Calculate the slope of a linear function.

3. Graph a linear function.
4. Use the slope-intercept form of a line.
5. Determine x- and y-intercepts.
6. Use a regression line to model data.
7. Test for a solution of a system of equations.
8. Solve a system of linear equations.
9. Identify an inconsistent or dependent system of equations.
10. Solve a system of two or three linear equations algebraically.
11. Solve a system of two or three linear equations using determinants (Cramer's rule).
12. Solve application problems involving systems of linear equations.

Chapter 6 – Factoring and Fractions

1. Factor algebraic expressions using common factors, the difference of squares, sum and difference of cubes, grouping, and techniques for trinomials.
2. Simplify algebraic fractions.
3. Add, subtract, multiply, and divide algebraic fractions.
4. Solve equations involving algebraic fractions.
5. Simplify complex fractions.

Chapter 7 – Quadratic Equations

1. Identify quadratic functions.
2. Solve quadratic functions by factoring, by completing the square, by using the quadratic formula, and by graphing.
3. Solve application problems involving quadratic equations.
4. Graph a quadratic function and identify important points on the curve.

Chapter 8 – Trigonometric Functions of Any Angle.

1. Determine the magnitude and sign of any trigonometric function of any angle.
2. Identify reference angles and use them to evaluate the trigonometric function of angles in any quadrant.
3. Express an angle in degrees or radians and convert between the two measurements.
4. Given the value of a trigonometric function of an angle, find the angle(s).
5. Use the radian measure of an angle to find the circular arc length.
6. Solve problems involving the area of a sector of a circle.
7. Solve problems involving angular velocity.
8. Solve application problems involving the trigonometric function of any angle.

Chapter 9 – Vectors and Oblique Triangles

1. Distinguish between a scalar and a vector.
2. Add vectors graphically using the polygon method and the parallelogram method.
3. Resolve a vector into its x- and y- components.
4. Add vectors by components.
5. Solve application problems involving vectors.
6. Solve oblique triangles using the law of sines and/or the law of cosines.
7. Solve application problems involving oblique triangles.

Chapter 10 – Graphs of the Trigonometric Functions

1. Graph the functions $y = \sin x$ and $y = \cos x$.
2. Determine amplitude, period, and displacement.
3. Graph the functions $y = a \sin x$ and $y = a \cos x$.
4. Graph the functions $y = a \sin bx$ and $y = a \cos bx$.
5. Graph the functions $y = a \sin(bx + c)$ and $y = a \cos(bx + c)$.
6. Graph the functions $y = \tan x$, $y = \cot x$, $y = \sec x$, and $y = \csc x$.
7. Solve application problems involving graphs of trigonometric functions.

Note: Every effort will be made to cover all the material listed above; however, in the event of unexpected time limitations, it may be necessary that some of the material be deleted. In such an event, the material deemed most important to the class objectives will be given preference.

Quizzes:

Quizzes may be given during any class period or lab.

Grading:

Performance objectives represent a minimum criterion for completion of the course. To obtain a satisfactory grade, the student must achieve an equivalent score of 60% or above on tests, reports, and the final examination. The weights of each category are as follows:

Homework/Quizzes	15%
3 - One Hour Exams	45%
Midterm Exam	20%
Final Exam	<u>20%</u>
Total	100%

Missed tests can be made up only if the student gets a written signed note from the university or doctor. The instructor may grant prior approval for missing a test, but the student must take the test at a time specified by the instructor, which may be earlier than the class in which the exam is given. The final exam will be scheduled in accordance with the college's final exam schedule.

Final letter grading will be determined as follows:

89.5 – 100	A
79.5 – 89.49	B
69.5 – 79.49	C
59.5 – 69.49	D
Below 59.5	F

Homework:

Homework will be done within MyMathLab and must be completed by the due date to receive full credit. Each student must complete the homework individually, following the student honor code. Each student must submit a signed pledge stating that "I have neither given nor received

unauthorized assistance on this assignment."

Attendance:

Students are expected to attend all classes for which they are enrolled. The college recognizes three types of absences:

1. An institutional absence resulting from the participation in an activity in which the student is officially representing the College
2. An unavoidable absence resulting from serious illness or death in the immediate family
3. an unnatural event beyond the normal control of the student

The College considers all other absences as willful, and it is the student's responsibility to provide a proper explanation to the instructor for institutional or unavoidable absences. Failure to do so immediately upon return to class will automatically make the absence willful. Make-up work is the responsibility of the student and at the acceptance of the instructor.

When the clock hours of willful absences exceed the semester hours of credit, the student may be withdrawn from the class. Refer to the college catalog for further information.

This course will adhere to the policies found in the BSC student handbook, please refer to the student handbook for more thorough coverage of the policies.

Test:

Tests must be taken on the assigned date. If you miss a test you must provide documentation of an institution-approved excused absence to take a makeup test. In some instances, the instructor may allow a test to be taken ahead of schedule if a student has advanced knowledge that they must miss a test for an inexcusable reason.

While some tests are take-home style open book tests, students are expected to complete each test without the help of other individuals or any web-based aids. Students may use their own notes, the textbook, a calculator, Excel, and GraphCalc. No other aids may be used. Each student will be required to submit a signed pledge stating that "I have neither given nor received unauthorized assistance on this test."

Any student caught cheating during a test will be removed from the class.

Quizzes:

Quizzes may be given during any class period. Students must be in class to take the quiz. Quiz makeups are not allowed; however, any student missing a quiz for an institutionally recognized excuse will be exempted from the quiz grade. It is the student's responsibility to notify the instructor of any excused absences.

Academic Integrity/Dishonesty:

I do expect students to assist each other in learning the material presented in this course. Sometimes the best way to learn is collectively through sharing ideas and knowledge. I do not approve of any student directly copying the work of another student. This action does nothing to

help the student better understand the material and is considered a violation of the student honor code.

Cheating includes but is not limited to:

1. Sharing work or answers with another student on non-cooperative assignments.
2. Using unauthorized aids on any test or exam.
3. Obtaining by any means past tests or assignments and presenting them as your own work
4. Obtaining by any means a past test before taking it.
5. Giving or receiving aid on any test or assignment in any manner not permitted by the instructor.

More information on academic integrity can be found in the college catalog and student handbook. These materials will also contain procedures for handling charges of academic dishonesty.

Calculators:

The student will need to bring his or her own calculator to class. Calculators are allowed on most quizzes, tests, and homework. However, calculators cannot be shared during quizzes or tests. Cellphones or Cellphone calculators are not allowed.

Attendance Policy:

Students are expected to attend all classes for which they are enrolled. Regular attendance for satisfactory completion of a course is an important part of the student's educational experience. The college recognizes three kinds of absences: (1) an institutional absence resulting from participation in an activity in which the student is officially representing the College; (2) an unavoidable absence resulting from illness, death in the immediate family, or unnatural cause beyond the control of the student; (3) all other absences are considered willful. It is the responsibility of the student to provide a proper explanation to the instructor for institutional or unavoidable absences. Failure to do so immediately upon return to class will automatically make the absence willful. The student should provide supporting documents for institutional and unavoidable absences. Make-up work is the responsibility of the student and at the acceptance of the instructor. When the number of clock hours of willful absences exceeds the number of semester hours of credit, the instructor will notify the Registrar that the student has exceeded the permissible number of absences and should be withdrawn from class.

Withdraw Policy:

A student withdrawing from the College on or before the twelfth Friday after the first class day of the semester will receive a grade of "W". During the summer semesters, the "W" period ends on the Friday immediately following the fourth week (eighth week for a ten week term) of the summer term. A student who does not meet attendance requirements and/or who fails to turn in assignments in a timely fashion as specified in the course syllabus may be withdrawn from class and receive a grade of "W". Withdrawing from courses after the "W" deadline date will be approved only through action by the Provost/Executive Vice-President for Academic Affairs. The Registrar will accept and process changes in schedule forms during the period only as authorized by the Provost/Executive Vice-President.

Accessibility Statement

Bluefield State College is committed to providing students, faculty, and staff with access to its facilities and the technology and information they need to succeed in and out of the classroom, and that these resources are accessible in accordance with applicable law.

This page contains resources for those who require accessible technology or who have questions about accessibility at the university.

Accommodation Requests

If you encounter something that is not accessible, please use the following contact information for submitting requests:

For Students:

Students who need accommodations should contact Carolyn Kirby, ADA Services Coordinator at ckirby@bluefieldstate.edu, or call (304) 327-4098.

Assistive Technology

Students needing assistive technology should contact Carolyn Kirby, ADA coordinator at ckirby@bluefieldstate.edu or (304) 327-4098.

Mission Statement

The mission of Bluefield State College, a historically black institution, is to prepare students for diverse professions, informed citizenship, community involvement, and public service in an ever-changing global society by providing an affordable, accessible opportunity for public higher education through certificate, associate, bachelor, and master degree programs.

ADA Accommodation

Any student who feels they may need an accommodation based on the impact of a disability should contact the Office for Academic Success Center at 304-327-4098 in Basic Science Room 110 to coordinate reasonable accommodations for students with documented disabilities.

Services for Disabled Students: Based on documentation and recommendation of services from physicians and therapists, the following services can be provided to students with disabilities:

- Extended test time
- Proctored tests
- Adaptive software
- Note-takers
- Sign-language interpreters
- And more (depending on the recommendation of therapist and/or physician)

This syllabus is tentative and subject to change by the instructor.