Central Virginia Community College
Where your future begins

MTH 162 Section 40QD
Pre-Calculus II
Spring 2022

Instructor Name: Mrs. Donna M. Ratliff
Office Number: Room 207 **Office Phone Number:** 434-946-2898 **Email:** dmratliff@amherst.k12.va.us **Office Hours:**   Mornings and afternoons by appointment
Credit/Contact Hours: 3 semester credits
Pre-requisites: Placement or completion of MTH 161: Precalculus I or equivalent with a grade of C or better

Textbooks/Materials Required: Provided by ACPS
 	
  ISBN: 978-0-538-73871-2
  Title: Precalculus
  Author: Larson
  Edition: 8th Edition

Classes Begin: Wednesday, January 18, 2022 Class Meeting Times: Monday – Friday, 9:45 – 10:35 am Lab Schedule if Applicable: N/A Classes End: Wednesday, June 8, 2022 **Drop Date (with refund): February 9, 2022** **Withdrawal Date(without penalty): April 13, 2022**
The syllabus attachment is available online at the following address @ https://centralvirginia.edu/Admissions/Calendar/Fall-2022

Course Description:

Presents trigonometry, trigonometric applications including Law of Sines and Cosines and an introduction to conics.
Credit will not be awarded for both MTH 162: Precalculus II and MTH 167: Precalculus with Trigonometry or equivalent.

General Course Goals/Purpose:

The general purpose of this one-semester course, in conjunction with Precalculus I, is to prepare students for the skills and level of rigor needed for successful study in a sequence of courses in calculus with analytic geometry.

Course Objectives:

- ❖ Trigonometric Functions
    - Identify angles in standard form in both degree and radian format and convert from one to the other.
    - Find the arc length.
    - Find the value of trigonometric functions of common angles without a calculator using the unit circle and right triangle trigonometry.
    - Use reference angles to evaluate trig functions.
    - Find the value of trigonometric functions of angles using a calculator.
    - Use fundamental trigonometric identities to simplify trigonometric expressions.
    - Graph the six trigonometric functions using the amplitude, period, phase and vertical shifts.
    - Use trig functions to model applications in the life and natural sciences.
- ❖ Analytic Trigonometry
    - Use the fundamental, quotient, Pythagorean, co-function, and even/odd identities to verify trigonometric identities.
    - Use the sum and difference, double angle, half-angle formulas to evaluate the exact values of trigonometric expressions.
    - Determine exact values of expressions, including composite expressions, involving inverse trigonometric functions.
    - Solve trigonometric equations over restricted and non-restricted domains.
- ❖ Applications of Trigonometry
    - Solve right triangles and applications involving right triangles.
    - Use the Law of Sines and Cosines to solve oblique triangles and applications.
    - Apply concepts of trigonometry to extended topics such as plotting polar coordinates, converting rectangular and polar coordinates from one to the other, identifying vector magnitude and direction, or performing operations with vectors such as addition, scalar multiplication, component form, and dot product.
- ❖ Conics
    - Identify the conic sections of the form: $Ax^2+By^2+Dx+Ey+F=0$.
    - Write the equations of circles, parabolas, ellipses, and hyperbolas in standard form centered both at the origin and not at the origin.
    - Identify essential characteristics unique to each conic.
    - Graph equations in conic sections, centered both at the origin and not at the origin.
    - Solve applications involving conic sections.
- ❖ Sequences and Series (Optional unit at the discretion of the department, not required for transfer.)
    - Identify the terms of geometric sequences.
    - Find a particular term of geometric sequence.
    - Determine the formula for the an term of geometric sequences.
    - Find the sum of first n terms of finite geometric series.
    - Find the sum of infinite geometric series.
    - Introduce arithmetic concepts as time allows.

Policies for Attendance and Missing Assignments:

Textbook Reading: Students are expected to read and study each section prior to the class lecture. This will enable students to more quickly grasp concepts during the lecture.

Homework: Students will be required to complete homework on a regular basis and are expected to work all homework with a pencil in a separate notebook/binder. Please make certain your work is legible; if I cannot read it, then it is wrong. Always copy the original problem and work out your solution; Please keep all your homework throughout the semester; I encourage you to keep a notebook/binder with your homework in it. It will serve as a source of review for quizzes and tests. Late homework will be accepted until the day of the test over the material, but will have a 10-point penalty.

Quizzes/Tests: There will be several quizzes during the semester. These quizzes will consist of problems similar to the homework and will be over the material we will have covered during class. Some quizzes will require memorization of rules or theorems, some quizzes will be calculator restricted. No sharing of calculators on quizzes or tests will be allowed.

There will be four tests—each of them generally will require the entire class time to complete.   Tests may be comprised of two parts, one calculator based, one non-calculator based. Test dates are listed on the course outline but may be revised by the instructor as necessary.   You will be required to do test corrections and this will count as a quiz grade. You will be required to re-work the problem and explain what you did wrong/justify your answer. More information about test corrections will be given later.

Calculator: Some problems will require the use of calculators. The required calculator is the TI-30XII-S, pictured below. You may **not** use a graphing calculator for any exercise. And you will not be allowed to use a graphing calculator for any tests. Although the use of a scientific calculator is allowed as you study, there will be some calculator restrictions on tests. As you study, do not become dependent on your calculator. This is a math course, not a calculator use course. No sharing of calculators will be allowed on any evaluation. **Graphing calculators will not be allowed**.

Texas Instrument 30X IIS
Scientific Calculator
Calculator with 2 line 11
character display, basic
scientific/trigonometry
functions and suitable for
algebra, geometry and
statistics

Supplies: 1. 3 ring binder for math notebook with clean loose leaf paper
2. Scientific calculator: **Only TI-30XIIs or other scientific calculator** may be used in MTH 163.
3. Graph paper 4-5 squares per inch
4. #2 pencils or mechanical pencils.

Classroom Expectations: All students are expected to behave in an appropriate manner for college level course work. Promptness and full class attendance are expected.

Grading Scale and Procedures:

There will be four 100-point tests, homework/assignments, quizzes, midterm and a cumulative final exam. Your lowest homework grade will be dropped. No test score will be dropped.   Your final grade will be based upon a 10 point scale and will be determined accordingly.

Tests/Quizzes……………………………………………..60%
Homework/Assignments………………………………….20%
Exam………………………………………………………….20%
Total……………………………………………………….100%

Your final grade will be based upon a 10-point scale.
90-100…………………………………………………….…..A
80-90………………………………………………………..... B
70-80………………………………………………………..... C
60-70………………………………………………………….D
Less than 60………………………………………….....……..F

Topics to be covered during course:

CHAPTER 4: TRIGONOMETRY: At the end of Chapter 4 students will be able to:

4.1   Describe angles with radian and degrees measure.
4.2   Identify points on a unit circle and evaluate the six trigonometric functions.
4.3   Evaluate trigonometric functions.
4.4   Use reference angles to evaluate trigonometric functions.
4.5   Solve right triangles.
4.6   Sketch graphs of trigonometric functions.
4.7   Evaluate inverse trigonometric functions.
4.8   Use trigonometric functions to model and solve real-life problems.

CHAPTER 5: ANALYTIC TRIGONOMETRY: At the end of Chapter 5 students will be able to:
5.1   Recognize and write the fundamental trigonometric identities.
5.2   Use the fundamental trigonometric identities to evaluate trigonometric functions.
5.3   Simplify and rewrite trigonometric expressions
5.4   Verify trigonometric identities.
5.5   Solve trigonometric equations.
5.6   Know and use the Sum and Difference, Multiple Angle and Power-reducing formulas.

CHAPTER 6:   ADDITIONAL TOPICS in TRIGONOMETRY: At the end of Chapter 6 students will be able to:
6.1   Use Law of Sines to solve oblique triangles [AAS,ASA, and SSA].
6.2   Use Law of Cosines to solve oblique triangles [SSS and SAS].

Skip to study Chapter 9

CHAPTER 9: SEQUENCES and SERIES: At the end of Chapter 9 students will be able to:
9.1   Use sequence notation to write terms of a sequence
9.2   Use factorial notation and evaluate factorial expressions.
9.3   Use summation notation to write sums and find the sum of an infinite series.
9.4   Recognize and write arithmetic and geometric sequences
9.5   Find the nth term of an arithmetic sequence and geometric sequence.
9.6   Find the nth partial sum of an arithmetic sequence.
9.7   Find the sum of an infinite geometric sequence.

CHAPTER 10: TOPICS in ANALYTIC GEOMETRY: At the end of Chapter 10 students will able to:
10.1   Write the standard form of the equation of a parabola, an ellipse and a hyperbola.
10.2   Classify a conic from its general equation.

10.3   Convert points and equations from rectangular to polar form and vice versa.
10.4   Sketch curves in polar coordinates.
10.5   Sketch curves represented by parametric equations. (If time allows)
10.6   Rewrite parametric equations as a single rectangular equation. (If time allows)

Student Accessibility Services:

Central VA Community College accommodates students with disabilities in accordance with federal laws and Virginia Community College System policy. Any student who feels s/he may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services (SAS) at 434.832.7299, 434.832.7802 or ADA@centralvirginia.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please see https://www.centralvirginia.edu/Student-Support/Student-Accessibility-Services

Title IX Syllabus Statement:

As a recipient of federal funds, Central VA Community College is required to comply with Title IX of the Higher Education Amendments of 1972, 20 U.S.C. § 1681 et seq. ("Title IX"), which prohibits discrimination on the basis of sex in educational programs or activities, admission and employment. Under certain circumstances, sexual misconduct, sexual harassment, and similar conduct constitute sexual discrimination prohibited by Title IX.

The purpose of this Policy is to establish that the College prohibits discrimination, harassment, sexual assault, domestic violence, dating violence, stalking, and retaliation and to set forth procedures by which such allegations shall be filed, investigated and resolved.

For assistance, please contact:

- **Title IX Coordinator, Marc Zoccola**
  Amherst Hall, Office #2102
  434.832.7804
  titleix@centralvirginia.edu
- **Emergency dial 911 or Campus Police 434.832.7700**

Early Alerts:

CVCC uses Navigate to inform students when they are performing poorly or have issues in a class, and kudos, to congratulate and encourage students when they are doing well. Instructors can raise flags and kudos at any time on their own, or through "Progress Surveys" which instructors fill out at specific times throughout the semester. The raising of a flag or posting of a kudo will trigger an automatic email to you (the student). Student Services may also contact you to inform you of any flags you have received and what you can do to have the flag removed and the resources CVCC offers to help achieve success in your course(s). CVCC's Student Services Coordinator Hunter Overstreet is the Early Alert lead and can be reached at: overstreeth@centralvirginia.edu, (434) 832 – 7799.
*** Note that flags DO NOT affect your grade or standing at CVCC, nor do they show up anywhere on your CVCC transcript. ***

Statements on Safety (where applicable):