MATH C098: SUPPORT FOR CALCULUS 1

Item	Value
Curriculum Committee Approval Date	10/27/2023
Top Code	170100 - Mathematics, General
Units	2 Total Units
Hours	36 Total Hours (Lecture Hours 36)
Total Outside of Class Hours	0
Course Credit Status	Credit: Support Course - Non-Degree Applicable (S)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Pass/No Pass (B)

Course Description

Math C098 is a concurrent support course for MATH C180 (Calculus 1). It is designed to review prerequisite skills necessary for success. Topics include the structure and properties of number systems; applications, solution and graphs of polynomials, rational, exponential, logarithmic and trigonometric functions; matrices; sequences and series; analytic geometry. Prepares students for MATH C180. Concurrent enrollment in specified sections of MATH C180 is required. COREQUISITE: MATH C180. NOT DEGREE APPLICABLE. Not Transferable.

Course Level Student Learning Outcome(s)

1. Given a function, find real and complex roots, graph polynomial and trigonometric equations, and decompose a rational expression.

Course Objectives

- 1. Solve quadratic and rational equations and inequalities.
- 2. Find the domain, range, and inverse and graph (with the translations) the following: linear, radical, polynomials, rational, exponential, and logarithmic functions.
- 3. Manipulate polynomials and solve polynomials equations using the Rational Zero Theorem, Synthetic Division, The Remainder Theorem, and Factor Theorem.
- 4. Solve polynomial equations by factoring and solve radical equations.
- 5. Simplify expressions involving integers and rational exponents and radicals and complex fractions.
- 6. Prove or establish trigonometric identities.
- 7. Decompose a fractional expression via partial fractions.
- 8. Graph the basic trigonometric functions and apply changes in period, phase, and amplitude to generate new graphs.
- 9. Evaluate and graph inverse trigonometric functions.
- 10. Use appropriate technology such as calculators or computer software to enhance mathematical thinking, visualization, and understanding to solve mathematical problems and to judge the reasonableness of the results.

Lecture Content

Order of Operations and Calculator Input Unit Conversion and Dimentional Analysis Factoring Polynomials Simplifying Rational Expressions Solving Linear and Rational Equations in One Variable Solving for a Variable in Equations with Many Variables Solving Systems of Equations Operations with Exponents Deginging Logarithms and Rules Scientific Notation Representing functions Linear Functions Quadratic Functions Trigonometric with Right Triangles The Unit Circle and Trigonometric Functions Area, Perimeter, and Arc Length

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Instructional Techniques

The instructor shall deliver lectures of course content; assign homework and quizzes; deal with math anxiety by establishing a friendly, student-centered learning environment; relate material in the course to real life and the outside world; involve active learning; and require participation and regular, substantive interaction (RSI), including student-to-student and student-to-instructor interaction through the use of individual, small-group and whole-class discussion; apply and include technology to increase motivation such as graphing calculators, the Internet, and computer software; and include appropriate methods of summative assessment including midterm and final exams.

Reading Assignments

Reading assignments are included as part of studying for and completing homework, quizzes, midterm exam(s), final exam, interaction and discussion, and individual and group projects as assigned.

Writing Assignments

Written and computer-based assignments are included as part of studying for and completing homework, quizzes, midterm exam(s), final exam, interaction and discussion, and individual and group projects as assigned.

Out-of-class Assignments

Out-of-class assignments are included as part of studying for and completing homework, quizzes, midterm exam(s), final exam, interaction and discussion, and individual and group projects as assigned.

Demonstration of Critical Thinking

Students will be able to choose from a variety of approaches to solve and explain solutions and justify reasoning verbally or in writing and may be included in classroom discussions, quizzes, midterm examination(s), final examination, and projects.

Required Writing, Problem Solving, Skills Demonstration

Students will be able to choose from a variety of approaches to solve and explain solutions and justify reasoning verbally or in writing and may be included in classroom discussions, quizzes, midterm examination(s), final examination, and projects.

Eligible Disciplines

Mathematics: Masters degree in mathematics or applied mathematics OR bachelors degree in either of the above AND masters degree in statistics, physics, or mathematics education OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Strang, G., Herman, E. . Calculus Volume 1, ed. Houston: Rice University , 2016 Rationale: Open Educational Resource (OER)

Software Resources

1. MyOpenMath. Libretexts, 2023 ed. LibreText MyOpenMath -- Free Online Management System