Southern New Hampshire University

Course Syllabus

Course Title: MAT – 140 Pre-Calculus
Location: Campbell High School **Year:** 2016 - 2017

Faculty: Diane Angelini

Email: dangelini@litchfieldsd.org

REQUIRED TEXTBOOK:
Connally, Hughes-Hallett, Gleason, et al., *Functions Modeling Change – A Preparation for Calculus,* 3rd edition, John Wiley & Sons, Inc.

REQUIRED CALCULATOR:
Students must have a TI-83/84 graphing calculator. A different graphing calculator is acceptable as long as the student knows how to use and support it. Students may NOT use an electronic device that is connected to the internet (such as a phone, laptop, etc.) in place of a graphing calculator.

COURSE DESCRIPTION:
This course emphasizes the algebra and concepts of functions. Students will learn the properties and graphing techniques for different types of functions including: linear, polynomial, rational, trigonometric, exponential, and logarithmic functions. Students will also learn to solve a variety of real world problems that rely on a number of different problem solving strategies and an understanding of these different types of functions.

STUDENT LEARNING OUTCOMES:
General Education Learning Goals are indicated in parenthesis)
Upon competition of MAT 140 students will be able to:

- Solve linear, polynomials, rational functions, trigonometric functions, exponential functions, and logarithmic functions. (**Knowledge of Human Cultures and the Physical and Natural World**) and (**Integration, Application, and Reflection**)
- Graph linear equations, polynomials, rational functions, trigonometric functions, exponential functions, and logarithmic functions. (**Communication**)
- Determine the inverse of a function
- Perform operations with functions
- Find the zeros of a function

COURSE COMPETENCIES:

- Explain and justify reasoning when solving mathematical problems.
- Apply and extend properties of number systems.
- Create tables, graphs, and equations as ways for depicting and analyzing patterns, relations and functions.
- Design models that can be used to represent and understand quantitative relationships.

COURSE TOPICS:

- Chapter 1 - Linear Functions and Change
- Chapter 2 - Functions
- Chapter 3 - Exponential Functions
- Chapter 4 - Logarithmic Functions
- Chapter 5 – Transformations of Functions and their Graphs
- Chapter 6 – Trigonometric Functions
- Chapter 7 – Trigonometry
- Chapter 8 – Compositions, Inverses, and Combinations of Functions
- Chapter 9 – Polynomial and Rational Functions

COURSE FORMAT:

The format of the course will include lecture, large group problem solving and small group work sessions.

COURSE EVALUATION CRITERIA AND GRADING POLICY:

Grading will be based on a *total point* system. Summative assessments (i.e., homework and class work assignments, quizzes and unit tests and the final exam) will account for 100% of the final grade. Students will have multiple opportunities to demonstrate a competent performance level of core competencies. There will be at least four of these opportunities per competency/per semester. Specific summative assessments are eligible for a retake.

All students will be required to take a cumulative Final Exam and the Final Exam results will be used to assess student competency for the SNHU Gen Ed according to the following rubric:

Criteria	**Not Evident**	**Limited**	**Developing**	**Competent**	**Accomplished**
Students will demonstrate a command of mathematics in the area of: +	Attain less than 35% correct.	Attain between 35% and 49% correct.	Attain between 50% and 64% correct.	Attain between 65% and 84% correct.	Attain at least 85% correct.
Points	**0**	**1**	**2**	**3**	**4**

Numerical grades will be rounded and converted into letter grades in the following manner:

93 – 100	A
90 – 92	A-
87 – 89	B+
83 – 86	B
80 – 82	B-
77 – 79	C+
73 – 76	C
70 – 72	C-
65 - 69	D
Below 65	F

Notes concerning homework:

- Keeping up with homework assignments is vital to success in the class!
- Homework will be assigned at the end of each class and is due in the next class meeting.
- No late homework will be accepted.
- Answers only are not acceptable; all necessary steps must be shown.
- Students experiencing trouble completing homework assignments are encouraged to see me and make an appointment for extra help!
- Before submitting homework, students should check the answers to odd-numbered problems in the back of the text to make sure that their solutions are correct.

Classroom Expectations*:*

- Be prepared – you must bring pens or pencils and a 3 ring binder with notebook paper and folders to every class.
- Be polite and respectful.
- Be productive – you will be an active learner during every class and class participation and collaboration in pairs and groups is essential to learning.
- Be proactive – you must take the initiative to let me know you need extra help as soon as you begin experiencing difficulty learning the concepts introduced in class.

Notes to Students:

- Keep every piece of paper that you come across in this class! Try and stay organized!
- This class is going to be a bit different than earlier math classes. You will constantly see problems that "don't look like" problems you had been working on. You will be pushed to apply what you know to different situations. Success here implies deep understanding.
- When you are stuck on problems away from class, don't just give up on them! There are tons of websites with useful information and you can, upon request, get access to a second Pre-Calculus text to use as a reference. Put effort into getting past roadblocks along the way!
- History in Pre-Calculus has proven that working with others from the class on homework, take-home assessments, or just studying material is beneficial. I encourage as many of you as possible to work together outside of class as frequently as it is feasible.

ATTENDANCE POLICY:

- Students are expected to attend and be present for the entire class meeting***.***
- Students should come to class prepared, plan to ask questions and participate in the class discussion.

Campbell High School's mission is to join together with parents, students, staff and community to become a collaboration of learners born of character, courage, respect and responsibility.

Students are expected to read and follow all rules and expectations as outlined in the student handbook.

Please sign to indicate that you have received, read and understand this document.

Student Name: _____ Student Signature: _____

Parent/Guardian's Signature: _____ Date: _____

Schedule

Chapter	Topic
2	Functions – input and output, domain and range, piecewise defined functions, composite and inverse functions, concavity, quadratic functions.
3	Exponential Functions – Introduction to the family of exponential functions, comparing exponential and linear functions, graphs of exponential functions, continuous growth and the number *e.*
4	Logarithmic Functions – Logarithms and their properties, Logarithms and exponential models, the logarithmic function.
5	Transformations of Functions and their Graphs – Vertical and horizontal shifts. Reflections and symmetry, vertical stretches and compressions, horizontal stretches and compressions.
6	Trigonometric Functions – Introduction to periodic functions, the sine and cosine functions, radians, graphs of the sine and cosine, sinusoidal functions, other trigonometric functions, inverse trigonometric functions.
7	Trigonometry – General triangles: laws of sines and cosines, trigonometric identities.
8	Compositions, Inverses, and Combinations of Functions – Composition of functions, inverse functions.
9	Polynomial and Rational Functions – Power functions, polynomial functions, the short-run behavior of polynomials, rational functions, the short-run behavior of rational functions, comparing power, exponential, and log functions. (Introduction to Limits)
10	Vectors and Matrices – Vectors, the components of a vector, application of vectors, the dot product, matrices.
11	Sequences and Series – Sequences, defining functions using sums: arithmetic series, finite geometric series, infinite geometric series.