MA-110 PRECALCULUS

Spring 2017 01/17 – 05/05/2017

MA-110-02: MWF 11:30am – 12:20pm HENR 109

INSTRUCTOR: Dr. CHOCK Y. WONG

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Office Hours: M,T & F: 10:30 – 11:30am; W: 12:30 – 1:30pm; or by appointments.

Course Description: Foundation for further study in mathematics. Primarily the preparatory course for MA-210/211 Calculus I/II. Topics include basic concepts and skills for functions and inverse functions, algebraic and graphic aspects of functions. In particular, polynomials and rational functions, exponential and logarithmic functions, trigonometric functions and their inverses, will be discussed in more details. Additional topics may include mathematical induction, Binomial Theorem, and introduction to complex numbers. Not open to students with credits from MA-210 or higher math courses.

Prerequisites: MA-103 or equivalent, or by placement test.

Text Book: **PRECALCULUS: Concepts through Functions** (Custom Edition for CUH). Sullivan/Sullivan. *Pearson Learning Solutions.* ISBN 1-269-37602-0.

Learning Ouitcomes: This course is designed to prepare students for calculus courses. By taking this course, students will

(1) gain better understanding of the fundamentals of coordinate geometry;
(2) gain understanding of the concept of functions: (i)algebraic definition and graph of a function, and (ii)combinations of functions;
(3) develop algebraic and graphical skills to work with polynomial and rational functions;
(4) develop algebraic and graphical skills to work with exponential and logarithmic functions;
(5) gain better understanding of trigonometric functions of real numbers;
(6) gain better understanding of trigonometric functions of angles;
(7) develop skills in analytic trigonometry: Using trigonometric identities in simplification and evaluation of trigonometric expressions;
(8) develop skills to solve trigonometric equations;
(9) gain understanding of more advanced topics in integer functions.

These learning outcomes are directly linked to the Program Learning Outcomes, especially in terms of

• to demonstrate the understanding and skills in reading, interpreting and communicating mathematical contents which are integrated into other disciplines or appear in everyday life

• to articulate the understanding of more advanced mathematical concepts and computational skills to support the study of other disciplines, including skills with numeric, analytic and graphic methods

Topics & Tentative Schedule This course will cover the following 14 lessons:

(1) Foundations: Distance formula & mid-point formula; circles. Week 1

(2) lines and linear functions. Week 2

(3) Functions – basics: Algebraic and graphical aspects. Week 3

(4) Quadratic functions & quadratic modeling. Week 4

(5) Polynomial functions: graphs; real zeros. Week 5 - 6

(6) Rational functions: graphs; asymptotes. Week 6 - 7

(7) More on functions: Composition functions; inverse functions. Week 7

(8) Exponential and logarithmic functions. Week 8

(9) Trigonometric functions (1): Trigonmetric ratios in a right triangle and in unit circle. Week 9

(10) Trigonometric functions (2): Trigonometric functions for any angle and the unit circle setting. Week 10

(11) Graphs of trigonometric functions. Week 11 - 12

(12) Trigonometric identities; inverse trigonometric functions. Week 12 - 13

(13) Trignomotrig equations. Week 13 - 14

(14) Integer functions; mathematical induction. Week 15

Calculators/Computers/Electronic Devices: A scientific calculator is required in class and is allowed in all quizzes and exams; graphic calculators are helpful but not required. **Please note that cellular phones, PC's, and any wireless devices are not allowed to be used in all quizzes and exams.** [Also, according to the CUH Student Handbook, the use of cellular, wireless and other mobile telephones while in class is prohibited; emergency calls shall be engaged in outside of the classroom; and according to the NS&M Division's policy, use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes at Chaminade.]

Homework: Since the course covers a wide veriety of topics and emphasizes math skills building, doing a large amount of exercises becomes an essential part of the learning process. The student will be given a list of recommended exercise problems (on-your-own, no need to turn in) from the textbook, and homework assignment worksheet (to be turn in) for each lesson. Very often an assisnment worksheet would just be a continuation of an "in-class project" during the lesson. You must turn in each assignment worksheet **on time**. You are encouraged to seek help from math tutoring web sites (for example, www.WolframAlpha.com) and form study groups to help each other. To help each student build up his/her basic math skills I may ask you to REDO a part of your assignment when it is necessary. In this case a temporary "R" grade will be marked on your paper and you need to resubmit your paper with corrections — many of my students have made tangible and significant pregress in math through that special process and greatly appreciate it. At any rate that is a second chance for you to work for a higher score in your assignment.

Follow the guidelines below when working at your assignment worksheet:

(1) Most importantly, turn in **on time**. Grading penalty will be given to late papers.
(2) Use the handout worksheet as cover page(s) and add in extra paper (regular 10.5x8 inches ruled paper) as needed, and staple all pages.
(3) Prefer using **pencil** in your work and leave **spaces between problems** — that way I can insert my corrections and comments to your work. (I am not willing to give corrections and comments to those solutions that were sloppily written or tightly squeezed together; and in extreme cases I may ask you to redo all problems.)
(4) Solutions written in red ink will not be accepted.
(5) Many assignments will involve **graph sketching** — be aware that it is an very important part of the course and you must do your best to draw better and better math graphs.

Quizzes and Exams:

Quizzes will be given after each lesson, with prior announced details. Be aware that **No** make-up quiz will be allowed except for school events (sports/conferences) or medical reasons with supporting documentation.

A **Mid-term exam** will be on the week of March 12, 2017, to cover Chapter 1 to 3.

The **Final Exam** will cover most of the topics of the course.

Grading: (subject to changes)

ATTENDANCE:	5% of the total	**A:**	$90 - 100\%$
HOMEWORK:	30% of the total	**B:**	$80 - 89\%$
QUIZZES:	20% of the total	**C:**	$70 - 79\%$
Mid-term EXAM:	15% of the total	**D:**	$60 - 69\%$
FINAL EXAM:	30% of the total	**F:**	below 60%