

**UNIVERSITY OF HAWAII – WEST O‘AHU
COURSE SYLLABUS FOR DR. LINDA H.L. FURUTO
MATH 135 – PRECALCULUS I ELEMENTARY FUNCTIONS
FALL 2012**

UHWO Mission Statement

The mission of the University of Hawai‘i – West O‘ahu is to become a four-year comprehensive university with an emphasis on baccalaureate education founded in the liberal arts, serving professional, career-related, and applied fields, based on State and regional needs. UH West O‘ahu is committed to providing access to residents throughout the State of Hawai‘i through its partnerships with the University of Hawai‘i community colleges and its delivery of distance education programs (UHWO General Catalog, 2012-2013).

I. Course Information

Course Title: Math 135 – Pre-Calculus I: Elementary Functions
CRN: 65139
Course Credits: 3 credits
Room Location: UHWO Laboratory Building E132
Meeting Times: TuTh 11:00-12:20 p.m.
Duration: August 20, 2012 – December 7, 2012

II. Instructor Contact Information

Faculty: Dr. Linda H.L. Furuto
Telephone No.: 808- 689-2358
Fax No.: 808-689-2901
Email: lfuruto@hawaii.edu
Office Location: UHWO Laboratory Building E112
Office Hours: TuTh 4:00-5:00 p.m. at Laboratory Building E112
Also available by appointment.
Course Website: <http://laulima.hawaii.edu>
This website has been created to provide additional references and assistance (i.e., messages, calendar, documents, etc.). All course materials are accessible online. You will need to access this with your UH account.

III. Textbooks

REQUIRED

Precalculus, by Michael Sullivan, 9th Edition. Publisher: Pearson/Prentice Hall Publishing Company, Copyright: 2012.

Graphing calculator required (TI-84 Plus Silver Edition recommended). Note that certain graphics and/or programmable calculators may not be allowed on quizzes and examinations (more information will be given in class).

IV. Course Description and Prerequisites

Math 135 – Pre-Calculus: Elementary Functions includes a variety of selected mathematical topics designed to acquaint students with a functional approach to algebra, including polynomial, exponential, and logarithmic functions; higher degree equations; inequalities; sequences; the binomial theorem; and partial fractions. This course is recommended for students pursuing further studies in business, economics, mathematics, and/or science-related fields.

Prerequisites: Grade of “C” or better in Math 103 – College Algebra, or equivalent coursework (within the past two years); placement into Math 135; or consent of instructor.

V. Course Objectives

Student Learning Outcomes

Upon successful completion of Math 135 – Pre-Calculus: Elementary Functions, the student will be able to apply critical thinking, including rules of logical sequence, to problem-solving. The student will have a clearer understanding and insight into algebraic and geometric concepts and techniques and into the power of mathematics and symbolic reasoning. Specifically, the student will be able to carry out the following (ILO – 3, GLO – 3):

1. Proficiently solve equations and inequalities, including those involving radical, exponential, and logarithmic expressions.
2. Examine, combine, and find the inverses of functions.
3. Use properties to construct graphs of relations and functions in the Cartesian plane, including conic sections.
4. Evaluate the properties of polynomial functions and their graphs, including symmetry, intercepts, and zeros with their multiplicities.
5. Analyze the properties of rational functions and their graphs, including domain, range, asymptotes, and intercepts.
6. Analyze the properties of exponential and logarithmic functions and their graphs, including domain, range, and asymptotes.
7. Model and solve various applications problems related to the studied relations and functions.

The aforementioned student learning outcomes are aligned with the UHWO Institutional Learning Outcome Critical Thinking (ILO – 3) to demonstrate critical thinking skills by applying information to make well-reasoned arguments or solve a problem, and the UHWO General Learning Outcome Symbolic Reasoning (GLO – 3) to use quantitative and symbolic reasoning to obtain accurate results in solving problems.

General Education Foundations – Symbolic Reasoning (FS)

This course falls under the designation of symbolic reasoning (FS). The hallmarks for symbolic reasoning include exposing students to the beauty and power of formal systems, as well as to their clarity and precision. This course does not focus solely on computational skills. Students should understand the concept of proof as a chain of inferences. They should be able to apply formal rules or algorithms, and engage in hypothetical reasoning. In addition, students will develop the ability to use appropriate symbolic techniques in the context of problem solving, and in the presentation and critical evaluation of evidence.

Instructor’s Goals and Objectives

This is a course about mathematics and mathematical thinking and is intended for the serious learner who is interested in studying deductive and inductive reasoning strategies in the context of mathematical situations and proofs. Students should be cognizant that doing mathematics amounts to solving problems, whether in class, textbook assignments, real-world applications, or other methods. Problems are the medium through which mathematical information ebbs and flows and are the most important part of this course. Therefore, much of the class meetings will be spent in a give-and-take discussion of problems, proofs, and reasoning.

The eminent mathematician George Polya separated problems of mathematics into two major categories: problems to find and problems to prove. Math 135 incorporates the heuristics of general problem solving. The student is implicitly encouraged to use diagrams, schematics, and representational models to assist thinking, to reason by analogy to similar situations, to develop a multiplicity of perspectives in viewing the facets of a mathematical idea, to work backwards from the desired result to the given status, to distinguish between patterns search and mathematical induction as well as between conjecture and verified generalization, to search for counterexamples, to exploit symmetry whenever possible, and to learn to ask important key questions: “Why?”; “How come?”; “What for?”; and “What if?”

Math 135 – Pre-Calculus: Elementary Functions students are encouraged to reflect on their own thinking in the context of a framework of reasoning generally accepted by mathematicians; to compare, contrast, sift, and winnow those patterns of reasoning; and to learn to carry on a mathematical conversation with him/herself by asking strategy-oriented internalized questions. Students should expect to develop skills in planning, formulating, communicating, executing, analyzing, and clarifying arguments and proofs, as well as understanding the deductive thinking of others. To assist in this process, we will be engaging in practical applications and a field study throughout the course of the semester. In past semesters, students have visited the Hōkūle‘a at Sand Island, Hawai‘i Institute of Marine Biology’s Coconut Island in Kane‘ohe Bay, and Mokauea Island Fishing Village near Honolulu International Airport to learn about intersections of cultural awareness, historical traditions, environmental conservation, and mathematics.

VI. Course Schedule/Outline

Please refer to the MS Excel spreadsheet for detailed information on the course schedule, including class dates, topics and activities for class sessions, reading assignments, due dates, and examination dates. Before each class, students are expected to peruse the section(s). During class, definitions and theorems will be clarified as needed, and problems will be illustrated. After class, students are expected to review and do homework problems, and then study the material for the next class.

The modes of instruction include lecture, class discussion, group work, use of overhead and LCD projectors, graphing calculators, computer software, and others. The initial portion of each class period will normally be utilized to discuss and clarify any questions from the preceding class meeting and the remaining portion will typically be used to present and discuss additional unit objectives. At the completion of each unit, a review will be conducted.

There are five major units that will be covered: linear, quadratic, and rational inequalities; general functions; polynomial functions; exponential and logarithmic functions; and systems of equations and matrices.

Unit 1: Linear, Quadratic, and Rational Inequalities

- Solve linear, quadratic and rational inequalities
- Use interval notation
- Solve absolute value equations and inequalities

Unit 2: General Functions

- Find domains and ranges of functions, including composite functions
- Recognize odd and even functions (symmetry)
- Define continuous and discontinuous functions
- Transform functions, including vertical and horizontal translations
- Use function notation
- Perform operations on functions, including addition, subtraction, multiplication, division, and composition of functions
- Define and graph inverse functions
- Graph piecewise-defined functions

Unit 3: Polynomial Functions

- Find all complex zeros of polynomial functions
- Graph general polynomial functions
- Graph rational functions including horizontal, vertical, slant and curvilinear asymptotes
- Graph radical functions

Unit 4: Exponential and Logarithmic Functions

- Graph exponential and logarithmic functions
- Use the properties of logarithms
- Solve exponential and logarithmic equations

- Solve applied problems of exponential and logarithmic function

Unit 5: Systems of Equations and Matrices

- Solve systems of linear equations: substitution, elimination, graphing
- Solve determinants
- Perform matrix algebra
- Use partial fraction decomposition
- Solve systems of nonlinear questions
- Solve systems of inequalities and linear programming

VI. Method of Grading and Student Evaluation

Evaluation will be determined by the successful completion of course objectives. The successful completion of course objectives will be determined in the following manner. To receive full credit for problems done on exams, daily quizzes, or for graded homework, you must show sufficient work in a clear and organized manner.

EXAMINATIONS

1. The student will take three unit exams covering topics from the major units. Each exam is normally worth 100 points and 1 hour in length. These exams are typically to be taken within the classroom environment and without any reference unless otherwise stipulated. Points will be assigned to each unit exam and the student must achieve a minimum of 50% for each unit exam.

The student will take a cumulative final exam which will be taken without references unless otherwise stipulated. The minimum level of achievement is 50%.

ASSIGNMENTS/HOMEWORK

2. Homework will be submitted weekly.

DAILY QUIZZES

3. It is expected that students will read the chapter prior to class. Therefore, there will be a short, daily 5-minute quiz at the beginning of each class period from 11:00-11:05 a.m. The questions will come from the homework assignment due and course material to be covered that day. Two of the lowest scores may be dropped.

4. **CLASS PARTICIPATION AND ETIQUETTE**

Attendance and class participation is mandatory. Your participation in class activities and discussions is important not only for your own learning but also the learning of others. If circumstances prevent you from attending class, please notify me in advance. Any student who misses the equivalent of two weeks of class will be counseled to drop the course. Extenuating circumstances will be dealt with on an individual basis.

Please be considerate of classmates. NO cell phones, iPods, or any other electronic devices (other than a calculator) may be used during class.

Percentage and Points Breakdown

Unit Examinations (3)	40.00%
Final Exam	20.00%
Daily Quizzes (~25)	10.00%
Assignments/Homework	25.00%
Class Participation	5.00%
	100.00%

Letter Grade Definition

A	Exceptional Achievement [93.33% - 100%] of cumulative points
A-	[90%, 93.33%)
B+	[86.67%, 90%)
B	Above Average Quality [83.33%, 86.67%) of cumulative points
B-	[80.00%, 83.33%)
C+	[77.67%, 80.00%)
C	Average/Acceptable Work [77.33%, 77.67%) of cumulative points
C-	[70.00%, 73.33%)
D+	[63.33%, 70.00%)
D	Minimally Passing or Not Fully Satisfactory [56.67%, 63.33%) of cumulative points
D-	[50.00%, 56.67%)
F	Not Satisfactory (Less than 50% of cumulative points) [0.00%, 50.00%)

VIII. Other Policies and Expectations

MAKE-UP POLICY

1. Exams and daily quizzes are to be taken on the designated date and at the designated time (there will be NO RETESTS). A student may take an exam or quiz earlier with vindicated reasons provided that the instructor consents. If a student is sick or unable to take an exam for any reason whatsoever, then the student must immediately notify the instructor and present to the instructor a written statement as to the reason(s) for not taking the exam at the specified date and time. If the instructor believes that the student has a good reason for not taking the exam at the specified date and time, then the instructor may choose to allow the student to take the exam later and to reduce the student's score on the exam which is taken later.

STUDY TIME

2. For every academic hour (which is defined to be 50 minutes of class meetings or lectures), the student should expect to study approximately 3-4 hours outside of the formal class meeting the following number of hours to achieve the respective grade. It is assumed that the student has satisfied the apropos mathematics prerequisites.

TURNITIN POLICY AND ACADEMIC DISHONESTY

3. UH West O‘ahu has a license agreement with iParadigms, LLC for the use of their plagiarism prevention and detection service popularly known as Turnitin. Turnitin rates work on originality based on exhaustive searches of billions of pages from both current and archived instances of the internet, millions of student papers previously submitted to Turnitin, and commercial databases of journal articles and periodicals. Turnitin does not make a determination if plagiarism has taken place. It makes an assessment of the submission's originality and reports that to the course instructor. These Originality Reports are tools to help your teacher locate potential sources of plagiarism in submitted papers. All papers submitted to Turnitin become part of Turnitin's reference database solely for the purpose of detecting plagiarism. Use of Turnitin is subject to the Usage Policy as posted on the Turnitin.com web site.

The University of Hawai‘i – West O‘ahu is an academic community with high professional standards. Its teaching, research, and service purposes are seriously disrupted and subverted by academic dishonesty, including plagiarism and cheating. In accordance with this, a student conduct code is defined below. The code delineates the appropriate hearing procedures and various sanctions that may be imposed, ranging from a warning, restitution where restitution is appropriate, to probation, suspension, expulsion, or the rescission of grades or degree. Copies of the student conduct code are available through the Student Services Office and on our website at: <http://www.uhwo.hawaii.edu/conduct>.

IX. Student Services

UHWO No‘eau Center for Writing, Math, and Academic Success

In Spring 2008, UH West O‘ahu opened a new undergraduate Math Center based on a National Science Foundation grant, which is now part of the UHWO No‘eau Center for Writing, Math, and Academic Success. UHWO mathematics combines academic mentoring with personalized tutoring and research experiences, all of which are critical to achieve our goal of increased student success in college, particularly for traditionally underrepresented students. Tutoring occurs in the UHWO No‘eau Center for Writing, Math, and Academic Success located in the Library Room 203 (Tel.: 808-689-2750), and open hours will be posted within the first couple weeks of classes. UHWO also has the capacity to facilitate online tutoring.

Physical or Learning Disability Accommodations

The University of Hawai‘i – West O‘ahu is committed to providing a working and learning atmosphere, which reasonably accommodates qualified persons with disabilities. If you have any disability that may impair your ability to complete this course successfully, please contact the Student Services Office at 808-689-2689. Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities.

Safety

The safety of students is a priority at the University of Hawai‘i – West O‘ahu. The telephone number for security at UHWO is 808-689-2911.