
FUNCTIONS, MODELING, PRECALC in Fall 2019 (MA1025)

Course Code	MA1025	Professor(s)	Melissa Cox
Prerequisites	None	Office Number	SD108
Class Schedule	F: 09:00-10:20 in PL-5 W: 09:00-11:55 in Q-509	Office Hours	Wed 12-1pm, Fri 10:30-11:30am
Credits	4	Email	mcox@aup.edu
Semester	Fall 2019	Office Tel. Ext.	

Course Description

Functions with Modeling, MA1025, is designed to provide students the additional algebraic and geometric skills that they need in order to follow with success a university calculus course – much like a precalculus course. It also develops skills in constructing, using, and interpreting mathematical models.

You will investigate and explore the properties of the following types of functions: linear, polynomial, rational, radical, exponential, logarithmic, and periodic. You will learn to sketch graphs and solve equations and inequalities involving the above functions. You will also become fluent in understanding and using function notation, in the notions of slope, change, and in interpreting graphs. You will do some work with computers, using graphing calculators, mathematical software and Excel. Applications are drawn from economics, business, finance, science, the environment, psychology, etc..

Course Learning Outcomes

- Develop a positive approach to mathematics.
- Appreciate the use of mathematics in modeling the world.
- Reason with quantitative information – in words, numbers and graphs.
- Clearly communicate quantitative information in words, numbers and with graphs.
- Develop strategies for solving problems.
- Understand functions by both algebraic and geometric approaches.
- understand linear, exponential and polynomial functions in depth.
- Be able to use computers to construct models of real-world situations using functions.
- Communicate clearly and concisely, both in writing and speaking.

General Education

The general education program at AUP consists of four requirements: *Speaking the World*, *Modeling the World*, *Mapping the World*, and *Comparing Worlds Past and Present*. This course can be used towards the *Modeling the World* requirement and as such has the following learning objectives:

- Develop a positive approach to mathematics
- Appreciate the use of mathematics in modeling the world
- Reason with quantitative information – in words, numbers, and graphs
- Clearly communicate quantitative information in words, numbers and with graphs
- Develop strategies for solving problems

Course Outline

The following is an outline of the subjects that will be addressed in the course. The precise schedule is flexible.

1. Algebra Review

- Working with fractions
- Order of operations
- Properties of real numbers
- Variables and variable expressions
- Simplifying and evaluating variable expressions
- Solving linear equations
- Exponent rules

2. Functions

- General definition
- Function notation
- Representing functions
- Domain, range
- Slope
- Composition of functions
- Transformations of functions

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- Absolute value functions
 - Inverse functions

3. Linear functions

- Linear functions and their graphs
- Slope
- Slope-intercept and point-slope equations of a line
- Solving linear equations
- Linear models and linear programming

4. Polynomial and Rational Functions

- Quadratic functions
- Polynomial functions
- Graphs
- Dividing polynomials
- Zeros of polynomial functions
- Rational functions
- Inverses and radical functions

5. Exponential and Logarithmic Functions

- Exponential functions and their graphs
- Logarithmic functions and their graphs
- Properties of logarithms
- Exponential and logarithmic equations
- Exponential Models

6. Periodic Functions

- Periodic functions and their graphs
- Properties of periodic functions

Periodic models

Textbooks

Title	Author	Publisher	ISBN	Required
Precalculus	Jay Abramson	OpenStax	ISBN-10: 1-947172-06-9 ISBN-13: 978-1-94	Yes

Attendance Policy

Students studying at The American University of Paris are expected to attend ALL scheduled classes, and in case of absence, should contact their professors to explain the situation. It is the student's responsibility to be aware of any specific attendance policy that a faculty member might have set in the course syllabus. The French Department, for example, has its own attendance policy, and students are responsible for compliance. Academic Affairs will excuse an absence for students' participation in study trips related to their courses.

Attendance at all exams is mandatory.

IN ALL CASES OF MISSED COURSE MEETINGS, THE RESPONSIBILITY FOR COMMUNICATION WITH THE PROFESSOR, AND FOR ARRANGING TO MAKE UP MISSED WORK, RESTS SOLELY WITH THE STUDENT.

Whether an absence is excused or not is ALWAYS up to the discretion of the professor or the department. Unexcused absences can result in a low or failing participation grade. In the case of excessive absences, it is up to the professor or the department to decide if the student will receive an "F" for the course. An instructor may recommend that a student withdraw, if absences have made it impossible to continue in the course at a satisfactory level.

Students must be mindful of this policy when making their travel arrangements, and especially during the Drop/Add and Exam Periods.

Grading Policy

Homework 20%

Quizzes, Attendance, Office Visits 30%

Midterm 20%

Final Exam 30%

Other
