# INTERAMERICAN UNIVERSITY OF PUERTO RICO
## METROPOLITAN CAMPUS
## COMPUTER SCIENCES AND MATHEMATICS DEPARTMENT
## MATHEMATICS PROGRAM
### Syllabus

## I. GENERAL INFORMATION

COURSE TITLE:            PRECALCULUS II
CODE AND NUMBER:      MATH 1512
CREDITS:                 3 credits
ACADEMIC TERM:
PROFESSOR:
OFFICE HOURS:
PHONE:
E-MAIL:

## II. COURSE DESCRIPTION

Study of the trigonometric and inverse trigonometric functions. Study of analytic trigonometry of complex numbers; of linear and nonlinear systems of equations; of inequalities; of matrices; of determinants and polar coordinates. Prerequisite MATH 1511

## III. GENERAL OBJECTIVES

At the end of the course, the student will be able to:
1. Use trigonometric functions in the Cartesian coordinate plane and the polar plane.
2. Apply graphing techniques for trigonometric functions.
3. Apply analytic trigonometry in problem solving
4. Solve operations with matrices.
5. Solve systems of linear and nonlinear equations and inequalities using diverse methodologies.
6. Solve application problems using systems of equations.
7. Integrate technology in a pertinent manner.
8. Communicate making use of appropriate and pertinent mathematical language.
9. Appreciate the importance of mathematics in the daily and professional life.

This course responds to Student Learning Outcomes for the BA in MATH numbers 1,3 and 4.

## IV. COURSE CONTENT

A. Trigonometric Functions
1. Angles and their measures
2. Trigonometric functions and the unit circle
3. Properties of Trigonometric functions
    - Basic identities
    - Domain and range
4. Graphs of sine and cosine
    - Domain and Range
    - Intersections with the axis
    - Amplitude, period, Phase shift
5. Graphs of Tangent, cotangent, secant and cosecant

B. Analytic trigonometry
1. Inverse trigonometric functions
2. Trigonometric Identities
3. Formulas for sum and difference of angles
4. Formulas for double and half angles
5. Trigonometric equations
6. Trigonometric form of complex numbers

C. Applications
1. Trigonometry of the right triangle
2. Law of sines
3. Law of cosines

D. Analytic Geometry
1. Polar coordinates

E. Systems of Equations
1. 2x2 systems of linear equations
   - Graphing
   - Substitution
   - Elimination
2. 3x3 systems of linear equations
3. Matrices
4. Determinants and the Cramer Rule
5. Nonlinear systems of equations
6. Systems of inequalities

## V. ACTIVITIES

A. Active Participation in class lectures and discussions
B. Online quizzes
C. Special assessment activities
D. Group work activities and collaborative learning
E. Pertinent use of technology
F. Communication activities (emails, 3-minute papers, surveys, etc…)
G. Word problem applications

## VI. EVALUATION CRITERIA

- 3 Partial Exams                              51%
- Cumulative Departmental Final Exam           20%
- Assignments                                  14%
- Quizzes                                      15%

           Total:                              100%

All the above criteria will be counted towards your final grade.
   Grade Scale:
      90-100  A
      80-89   B
      70-65   C
      65-55   D
       0-54   F

## VII. SPECIAL NOTES

1. **Rights of disabled students:**

   All students who require auxiliary services or special assistance must request them at the beginning of the course or as soon as they become aware of what they need, through the corresponding register in the Office of the Professional Counselor, Dr. María de los Ángeles Cabello, located in the University Orientation Program, Ext. 2306. Email mcabello@metro.inter.edu.

2. **Warning about honesty, fraud and plagiarism**:

   Lack of honesty, fraud, plagiarism and any other inadequate behavior related to the academic endeavor constitute major infringements sanctioned by the General Student Manual.  Major infringements, as stated by the General Student Manual, may result in a suspension for more than a year or the permanent expulsion from the university, among other sanctions.

3. **Use of electronic devices**:

   All cellular phones and electronic devices must be deactivated because of possible interruptions with the teaching learning process to dissuade the disruption of the academic excellence environment. All emergencies will be managed accordingly. It is prohibited the use of electronic devices that could access, store or send/receive data during evaluations and exams.

4. **Compliance with the provisions of Title IX**

   The Federal Higher Education Act, as amended, prohibits sex discrimination in any academic, educational, extracurricular, athletic, or any other program or employment, sponsored or controlled by an institution of higher education regardless of whether it is conducted inside or outside the institution's premises, if the institution receives federal funds.

   As provided by current federal regulations, a Title IX Assistant Coordinator has been designated in our academic unit to provide assistance and guidance in relation to any alleged

   incident of discrimination based on sex or gender, sexual harassment or sexual assault . You can contact the Assistant Coordinator

   The Normative Document entitled *Standards and Procedures for Responding to Alleged Violations of Title IX Provisions* contains the institutional rules for channeling any complaint that is based on this type of allegation. This document is available on the website of the of the Inter-American University of Puerto Rico (www.inter.edu).

## VIII. Educational Resources

1. Text:  Precalculus, 5<sup>th</sup>ed, Educo International 2012
2. Scientific calculador

## IX. BIBLIOGRAPHY

*  Stewart J. (2012). Precálculo – Matemáticas para el Cálculo.  Sexta Edición. Thomson Editores. México.

* Blitzer. R. (2014). Precalculus. 5ta Edición. Pearson. Prentice Hall. New Jersey.

* Dugopolski M. (2012). Precalculus: Functions and Graphs. Fourth Edtion Addison- Wesley. New York.

* Larson, R (2014). Precalculus. Ninth Edition. Brooks/Cole. Cengage Learning.

* Stewart J. (2012). Precalculus: Mathematics for Calculus. Fourth Edition. Brooks/Cole. California.

* Sullivan (2016). Precalculus Plus My MathLab.  Tenth Editio. Pearson. Addison- Wesley. New Cork.

* Schultz E, Briggs, W; Cochran L. (2014). Precalculus eText. Pearson. Addison- Wesley. New York.

B. REFERENCIAS ELECTRÓNICAS * Khan Academy – Álgebra I: http://es.khanacademy.org/math/algebra * Khan Academy – Álgebra II: http://es.khanacademy.org/math/algebra2 * Graphing Functions: http://www.analyzemath.com/Graphing.html

* Graphing tool: Padowan Grapher for Windows: http://www.padowan.dk/download/ * Math problems solution tool: Mathway: https://www.mathway.com/

Reviewed: October/2022