

**INTER-AMERICAN UNIVERSITY OF PUERTO RICO
VICE PRESIDENCY OF ACADEMIC AND STUDENT AFFAIRS
GENERAL EDUCATION PROGRAM**

SYLLABUS

I. OVERVIEW

Course Title	QUANTITATIVE REASONING
Code and number	GEMA 1000
Credits	Three (3)
Academic Term	AUGUST-DECEMBER 2022 (202310)
Professor	
Place and office hours	
Office phone number	(787)2501912 EXT.2230
E-mail	

II. DESCRIPTION

Study of the set of real numbers, measurement systems, geometry (length, area, and volume), resolution of equations for a linear variable that includes ratios, proportions, financial math formulas, and literal equations. Basic concepts of statistics: frequency distribution, graphs, central tendency measures, dispersion and probability principles. Requires additional hours of virtual open lab. .

III. GOALS, COMPETENCIES AND AREAS OF COMPETENCES

Goal I: Develop a person with humanistic sensitivity, able to contribute to the solution of problems with a collaborative attitude, using research, critical, creative and innovative thinking, in an international context.

Competence #1: Demonstrate a critical, creative, scientific, humanistic, ethical and aesthetic attitude to problem solving, based on the use of research methods, sources of information and technological advances.

Skills Areas:

- Problem solving

Competence #2: Demonstrate capacity and willingness for collaborative work and negotiation.

Skills Areas:

- Critical thinking
- Problem solving
- Collaborative work
- Handling information
- Ethical awareness

Goal VI: Develop a person capable of solving problems through scientific thinking, logical and quantitative reasoning and the use of information and communication technologies, in an ethical, critical, creative and innovative way.

Competence #9: Apply scientific thinking and logical and quantitative reasoning for decision-making and problem solving.

Competence #10: Use information and communication technologies for decision-making and problem solving.

Skills Areas:

- Scientific Thinking (E)
- Logical and quantitative reasoning (E)
- Decision-making process (T)
- Problem solving process* (T)
- Technology Integration (T)

IV. OBJECTIVES

It is expected that at the end of the course, the student will be able to:

1. Describe the set of real numbers and the subsets that constitute it, in addition to applying the real numbers to problem solving.
2. Use English and metric measurement systems, their units and conversions within and between them.
3. Apply the fundamental concepts of Euclidean geometry and its application in daily life.
4. Solve practical situations using linear equations in one variable..
5. Solve practical elementary problems using proportions in a single variable.
6. Apply elementary concepts and formulas of descriptive statistics and probability.
7. To value the usefulness of mathematics in science, commerce, technology and the arts.
8. To use the different technological means that are available to us, for the solution of mathematical problems.

V. CONTENT

A. The system of real numbers and their representation in the number line.

1. Study of real numbers
 - a. Natural
 - b. Whole
 - c. Rational
 - d. Irrational
 - e. Real

2. Order of operations
3. Application problems

B. Measuring systems

1. Units of measurement of length, mass, time and capacity
2. Conversion in and between systems
 - a. Metric
 - b. English
3. Estimate

4. Application problems
- C. Geometry
1. Geometric figures in two and three dimensions
 - a. Point, segment, line, angle, polygons, circumference
 - b. Cube, cone, sphere, cylinder, polyhedral and prisms
 2. Perimeter, area and volume
 3. Problem solving
- D. Algebraic expressions
1. Basic concepts
 - a. Constant
 - b. Variable
 - c. Term
 - d. Coefficient
 - e. Degree
 - f. Polynomial
 2. Evaluation of algebraic expressions
- E. Equations
1. Definition and equality properties
 2. Solving linear equations
 3. Using formulas
 - a. Formula evaluation
 - b. Solving for a variable
 4. Ratios, proportions and percentages
 5. Financial math formulas
 6. Application problems
- F. Basic statistics concepts
1. Frequency distribution, construction and interpretation of graphs
 - a. Scatter plot
 - b. Frequency polygon
 - c. Histogram
 - d. Bar diagram
 - e. Circular diagram
 2. Calculation and interpretation of central trend measures
 - a. Mean
 - b. Median
 - c. Mode
 3. Calculation and interpretation of dispersion measures

- a. Range
- b. Standard deviation

G. Probability

- 1. Definition and basics of probability
- 2. Simple events

VI. ACTIVITIES

- 1. Collaborative work.
- 2. Use of manipulatives for fractions, decimals, geometry, measurement and statistics.
- 3. Educational video usage.
- 4. Applications of the topic discussed where the student can relate it to their daily living and with other courses from other disciplines.
- 5. Applications where the student can implement the use of technological resources such as computer, web usage calculator, etc.

VII. SUGGESTED ASSESSMENT

Criteria	Score	% of the Final Note
Three Partial Exams	300	51
Final exam or equivalent evaluation	100	20
Quizzes	100	15
Assignments	100	10
Assessment, tutorials, attendance	100	4
Total	700	100

The note scale will be as follows:

- 90 – 100 A
- 80 - 89 B
- 70 - 79 C
- 60 - 69 D
- 0 - 59 F

VIII. SPECIAL NOTES

A. Auxiliary services or special needs

Any student who requires auxiliary services or special assistance must request them at the beginning of the course or as soon as they become aware that they need them, through the corresponding registration, in the office of the Professional Counselor, Coordinator of Student Services with Disabilities, located in the University Orientation Program. The counselor for the Science & Technology Division is Prof. M. Cabellos -4th Floor Inter

B. Honesty, fraud and plagiarism

Dishonesty, fraud, plagiarism and any other inappropriate behavior in relation to academic work constitute major violations sanctioned by the General Student Regulations. Major infractions, as provided for in the General Student Regulations, may result in the suspension of the University for a defined time of more than one year or permanent expulsion from the University, among other sanctions.

C. Use of electronic devices

Cell phones and any other electronic devices that could disrupt teaching and learning processes or alter the environment leading to academic excellence will be disabled. Pressing situations will be addressed, as appropriate. The handling of electronic devices that allow access, storage or sending data during evaluations or examinations is prohibited.

D. Compliance with the provisions of Title IX

The Federal Higher Education Act, as amended, prohibits discrimination on the basis of sex in any academic, educational, extracurricular, athletic, or other program or employment, sponsored or controlled by a higher education institution regardless of whether it is performed on or off the premises of the institution, if the institution receives federal funds.

As provided for in the current federal regulations, our academic unit has appointed a Title IX Auxiliary Coordinator who will provide assistance and guidance in connection with any alleged incident constituting discrimination for sex or gender, sexual harassment or sexual assault. You can contact the Auxiliary Coordinator, George Rivera, Director of Security, at 787-250-1912, extension 2147, or email grivera@metro.inter.edu.

*The purpose of the Law entitled Rules and Procedures for Dealing with Alleged **Violations of the Provisions of Title IX** is the document containing the institutional rules for channeling any complaint that is presented based on this type of claim. This document is available on the portal of the Inter-American University of Puerto Rico (www.inter.edu).*

IX. EDUCATIONAL RESOURCES

1. [http:// www.coolmath.com](http://www.coolmath.com) www.coolmath.com (Select The Theme of Álgebra)
2. [http:// www.sosmath.com](http://www.sosmath.com) (Select the topic of Álgebra I)
3. <http://virtualnerd.com/pre-algebra>
4. <https://es.khanacademy.org/math/pre-algebra>
5. <https://www.symbolab.com/solver>
6. <https://www.mathway.com>
7. The Natural Numbers Set
<http://www.aulafacil.com/matematicas-numeros-naturales/curso/Temario.htm>
8. Decimal numbers:
<http://www.aulafacil.com/matematicas-numeros-decimales/curso/Temario.htm>
9. Prime numbers:
<http://www.aulafacil.com/matematicas-divisibilidad/curso/Temario.htm>
10. Fractions:
<http://www.aulafacil.com/matematicas-fracciones/curso/Temario.htm>
11. definitions on geometry topics:

- <http://www.salonhogar.com/matemat/geometria/index.htm>
12. Geometry formulas and their figures:
<http://www.vitutor.net/1/43.html>
 13. Geometry Basics: <http://www.slideshare.net/ed0391/geometra>
 14. Geometric Figures Videos: <http://youtu.be/5INLvpKQYvU>
 15. Interactive theme pages in geometry:
<http://www.aulafacil.com/matematicas-areas-geometria/curso/Temario.htm>
<http://aulafacil.com/matematicas-basicas/geometria/curso/Temario.htm>
 16. Metric System Interactive Page:
<http://www.aulafacil.com/sistema-metrico/curso/Temario.htm> Algebra Interactive Page:
<http://www.aulafacil.com/algebra/curso/Temario.htm>
 17. Video of how to solve linear equation with a variable:
<http://www.youtube.com/watch?v=xUWLZY4roM>
 18. Concepts of linear equations with a variable:
<http://www.sapiensman.com/matematicas/matematicas30.htm>
 19. Concepts of linear equations with a variable in application problem solving: PDF
<http://math.uprag.edu/pronver.pdf>
 20. Concepts of linear equations with a variable and troubleshooting:
<http://www.scribd.com/doc/21995483/Ecuaciones-Lineales>
 21. Introduction to Descriptive Statistics: <http://www.aulafacil.com/CursoEstadistica/Lecc-1-est.htm>
 22. Scattering measures: <http://www.aulafacil.com/CursoEstadistica/Lecc-6-est.htm>
 23. Frequency distribution: <http://www.aulafacil.com/CursoEstadistica/Lecc-2-est.htm>
 24. Central Position Measures (Central Trend Measures):
<http://www.aulafacil.com/CursoEstadistica/Lecc-4-est.htm>

X. BIBLIOGRAPHY

Textbook:

Sharma, M. Sharma L. Prealgebra. (2011) Publishing house: Educosoft International

Bello, Ignacio, (2009) University Basic Mathematics. First edition,, Mc Graw Hill QA39.2 B44418 2009

Miller, Charles David, (2013) Mathematics: Reasoning and Applications. 13ra edition, Pearson Education of Mexico QA39.2 . M5518 2013

Rodríguez Ahumada, José G. (2000) Mathematical Reasoning: Fundamentals and Applications. Second Edition, International Thomson QA37.2 . R63 2000

Revised January 2023