INTER-AMERICAN UNIVERSITY OF PUERTO RICO

METROPOLITAN CAMPUS

FACULTY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER AND MATHEMATICS SCIENCES

SYLLABUS

I. GENERAL INFORMATION

Course title	**CALCULUS II**
Code and number	**MATH 2252**
Credits	**FOUR (4)**
Academic term	
Professor	
Office hours	
Phone	**787-250-1912 Ext. 2230**
Email	

II. DESCRIPTION

Study of the derivatives and integrals of inverse, hyperbolic and inverse hyperbolic trigonometric functions: integration techniques and polar coordinates. Application of area and arc length in polar coordinates. Study of the improper integrals, the indeterminate forms and the application of the L'Hôspital rule. Study of successions and infinite series: convergence and the derivatives and integrals of power series. Representation of functions through series of powers, Taylor and Maclaurin. Study of Taylor's Theorem and the application of Taylor polynomials in approximations.
Requirement: MATH 2251.

III. PROFILE OF COMPETENCES

The Bachelor of Arts in Mathematics Program is designed to develop general competencies, linked to core courses, which allows the student to:

• Affirm the value and usefulness of mathematics in all aspects of daily life and in teamwork.

IV. OBJECTIVES

At the end of the course the student will be able to:

1. Understand the derivatives and integrals of the inverse and hyperbolic trigonometric functions.

2. Use the different integration techniques, as applicable.

3. Apply knowledge of polar coordinates in solving problems.

4. Evaluate improper indeterminate and integral forms.

5. Use the different criteria to determine the convergence of infinite series.

6. Apply the theory of power series.

7. Integrate the use of technology when appropriate.

8. Communicate ethically and appropriately using the relevant mathematical language.

9. Comprehend the use of mathematics in human affairs and in daily life.

V. COURSE CONTENT

A. Inverse trigonometric functions
    1. Derivatives
    2. Integrals

B. Hyperbolic functions
    1. Derivatives
    2. Integrals

C. Integration techniques
    1. Replacement
    2. By parts
    3. Completing the square
    4. Partial fractions
    5. Powers of trigonometric functions
    6. Trigonometric substitutions
    7. Breast and cosine products
    8. Reduction formulas and tables

D. Indeterminate forms
    1. The indeterminate forms 0/0 and

2. L'Hopital's Rule
3. Other indeterminate forms reducible to one of the previous two

E. Flat curves and polar coordinates
1. Graphics
a. Review of change of coordinates
b. Areas
c. Arc length

F. Improper integrals
1. Definition and examples
2. Evaluation of improper integrals
3. Unsuitable convergent and divergent integrals

G. Sequences and number series
1. Definition of infinite succession and examples
2. Convergent and divergent succession
3. Monotonous succession
4. Bounded succession
5. Higher and supreme level
6. Lower bound and infimo
7. Definition of series and examples
8. Convergent and divergent series
9. Sum and partial sum of a series
10. Geometrical, telescopic series and their corresponding sums
11. Succession of partial sums of a series
12. Convergence criteria for positive series and series p.
13. Alternating series
14. Criteria of reason and root
15. Absolute and conditional convergence.

H. Power series
1. Definition and examples.
2. Interval and radius of convergence.
3. Taylor series.
4. Maclaurin series
5. Taylor's formula and applications.

VI. ACTIVITIES

1. Active participation in conferences and discussions
2. Practice exercises in the classroom
3. Communication activities (reading and writing in the classroom)
4. Use of relevant technology to interpret and analyze data.

5. Solution of application problems
6. Collaborative learning
7. Reflective Journal, emails, “three minute papers”, “surveys”, etc.
8. Use different types of functions to model real situations.

VII. EVALUATION CRITERIA

Criteria	Score	% Score of the Final
Two partial exams	100 c/u	50%
Final Exam Cumulative	100	15%
Assignments, Forums	100	15%
Short Tests	100	20%
Total	**500**	**100%**

A. The grade curve will be:

90 - 100 A
80 - 89 B
65 - 79 C
55 - 64 D
0 - 54 F

VIII. SPECIAL NOTES

A. Auxiliary services or special needs

Students who requires auxiliary services or special assistance must request it at the beginning of the course or as soon as they know they need it, through the corresponding registration in the office of the professional counselor, Dr. María de los Ángeles Cabello, located in the Program of University Orientation, Ext. 2306. Email mcabello@metro.inter.edu

B. Honesty, fraud and plagiarism

The lack of honesty, fraud, plagiarism and any other inappropriate behavior in relation to academic work constitute major infractions sanctioned by the General Student Regulations. Major infractions, as provided in the General Student Regulations, may result in the suspension of the University for a defined period 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 device that could disrupt teaching and learning processes or alter the environment conducive to academic excellence will be disabled. The pressing situations will be addressed, as appropriate. The use of electronic devices that allow accessing, storing, 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 based on of sex in any academic, educational, extracurricular, athletic activity or any other program or employment, sponsored or controlled by a higher education institution regardless of whether it is performed inside or outside the premises of the institution, if the institution receives federal funds.
As provided by the 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 constituting discrimination based on sex or gender, sexual harassment or sexual assault. You can contact the Auxiliary Coordinator at telephone 787 250-1912, extension 2262, or email griverar@metro.inter.edu
The Normative Document titled Rules and Procedures to Address Alleged Violations of the Provisions of Title IX is the document that contains the institutional rules to channel any complaint filed based on this type of claim. This document is available on the website of the Inter-American University of Puerto Rico (www.inter.edu).

E. Course requirements

1. It is a requirement that the student have access to a computer with Internet and the MS Office applications programs, compatible with the IBM system.

2. If the course offering is online or hybrid with remote virtual meetings, the exams are answered guarded with RESPONDUS or RPNow. It is the student's responsibility to find out about it. To use the applications, you must have access to a computer with a camera and microphone and good Internet service. Respondus or RPNow does not work on mobile devices and neither does it work with satellite Internet. You should read more information in the General Information link on the Blackboard home page, in particular the links:

- Student authentication
- Authentication process as a student in distance courses
- "RPNow" for exams or tests guarded

Any questions in this regard the student should contact the professor or staff at the Center for Distance Learning and Technological Development (CAADT)

IX. EDUCATIONAL RESOURCES

1. Text book: Precalculus, 5th ed, Educo International 2012
2. Scientific calculator. You can use a graphing calculator.
3. NO graphic calculator that has CAS (such as TI-89 or equivalent) is allowed.

X. REFERENCES

A. BIBLIOGRAPHY

Anton, Howard, I. Bivens, S. Davis. (2003) Calculus. Seventh edition. John Wiley & Sons.

Anton, Howard, S. Davis, I. Bivens. (2001). Calculus, Early Transcendental Brief Edition. John Wiley & Sons.

Finney R., Weir M., Giordano F. (2001). Calculus Tenth Edition. Addison Wesley.

Hille E. & Salinas S. (1997). Calculus Tenth edition. Addison Wesley.

Larson, Ron, Hostetler, Robert P., Edwards, Bruce A. (2003). Calculus-Early Transcendental Functions. Third edition, Houghton Miffin Company.

Smith R., Minton R. (2002). Calculus Second Edition Mc Graw Hill.

Stewart (2004) Calculus. Fifth Edition. Thomson - Brooks Cole.

B. INTERNET REFERENCES

http: //archives.math.utk.edu.visual.calculus/
http://archives.math.utk.edu/calculus/crol.html
http://www.ima.umn.edu/~arnold/graphics.html
http://www.math.temple.edu/~cow/
http://www.calculus.org