

## DE LA SALLE UNIVERSITY College of Science Department of Mathematics



**ISMATH2** – Basic Calculus with Business Applications (for BS IS Students) Prerequisite: ISMATH1

Prerequisite to:

Instructor:\_\_\_\_\_ Consultation Hours:

Contact details:\_\_\_\_\_ Class Schedule and Room:

## **Course Description**

Designed for Information System students, a course covering topics in planeanalytic geometry and differential calculus with emphasis on its applications in business and economics.

# Learning Outcomes

	On completion of this course, the student is expected to present the following learning outcomes in line with					
	the Expected Lasallian Graduate At	ttributes (ELGA)				
ELGA Learning Outcome						
	Critical and Creative Thinker	At the end of the course, the student will be able to apply limits,				
	Effective Communicator	continuity and differentiation in solving various conceptual and real-				
	Lifelong Learner	world problems in business and economics.				
	Service-Driven Citizen					

## Final Course Output

As evidence of attaining the above learning outcomes, the student is required to submit the following during the indicated dates of the term.

Learning Outcome	Required Output	Due Date
At the end of the course, the student will be	Collaborative activity on sketching the	End of 7 <sup>th</sup>
able to apply limits, continuity and	graph of conic sections and other	week
differentiation in solving various conceptual	functions using graphmatica software.	
and real-world problems in business and	Give at least 2 real life business	1 week
economics.	applications of mathematical concepts	before final
	learned.	exam

## Rubric for assessment

CRITERIA	Excellent (4)	Good (3) Satisfacto		Needs Improvement (1)
Understanding (50%)	The solution shows a deep understanding of the problem including the ability to identify the appropriate mathematical concepts and information necessary for its solution.	The solution shows that student has a broad understanding of the problem and the major concepts necessary for its solution.	The solution is not complete indicating that parts of the problem are not understood.	There is no solution, or the solution has no relationship to the task.
Strategies and Procedures (15%)	Uses a very efficient strategy leading directly to a solution. Applies procedures accurately to correctly solve the problem and verifies the result.	Uses strategy that leads to a solution of the problem. All parts are correct and a correct answer is achieved.	Uses a strategy that is partially useful, leading some way toward a solution but not to a full solution of the problem. Some parts may be correct but a correct answer is not achieved.	No evidence of a strategy or procedure uses strategy that does not help solve the problem.
Communication (10%)	There is a clear, effective explanation, detailing how the problem is solved. There is a precise and appropriate use of mathematical terminology and notation.	There is a clear explanation and appropriate use of accurate mathematical representation.	There is some use of appropriate mathematical representation but explanation is incomplete and not clearly presented.	There is no explanation or the solution cannot be understood or it is unrelated to the problem.

Integration (10%)	Demonstrates integration of the concepts presented	Demonstrates some integration of the concepts presented	Demonstrates limited integration of the concepts presented	Demonstrates no integration of the concepts presented
Accuracy of Computations/ Solutions (15%)	Computations / solutions are correct and explained correctly	Computations/ solutions are correct but not explained well.	Computations/ solutions have some errors.	Incorrect computations/ solutions

## Additional Requirements

At least 3 Quizzes, 1 Final Exam, Seatwork, Assignment, Recitation, Group Work, Business Simulations

## Grading System

				Scale:	
	FOR EXEMPTED	FOR ST with FIN	TUDENTS NAL EXAM	95-100% 89-94%	4.0 3.5
	STUDENTS (w/out Final Exam)	with With 78 no missed one missed 72 quiz quiz 66	78-82% 72-77% 66-71%	3.0 2.5 2.0 1.5	
Average of quizzes & Project	90%	60%	50%	60-65% <60%	1.0 0.0
Seatwork, Assignment, Learning Output	10%	10%	10%		
Final exam	-	30%	40%	]	

## Learning Plan

LEARNING	TOPIC	WEEK	LEARNING
OUTCOME		NO.	ACTIVITIES
	Functions and Their Graphs	Weeks	Graphs of functions and their
	1.1 Functions	1 - 3	domain and range through:
	1.2 The Graph of a Function		<ul> <li>Manual computations</li> </ul>
	1.3 Linear Functions		GRAPHMATICA
	(slope-intercept form, point-		
	slope form, two-point form,		
	intercept-form and general		
	form)		
	1.4 Quadratic Functions		
	1.5 Rational Functions		
	1.6 Inverse Functions		
	1.7 Exponential and Logarithmic		
	Functions		
	Quiz 1	Week 3	
	Quadratic Equations in Two	Weeks	General and standard forms
	Variables	4 - 5	of the quadratic equation in
	2.1 Parabola		two variables, and their
	2.2 Ellipse		corresponding conic
	2.3 Circle		sections through:
	2.4 Hyperbola		<ul> <li>Manual computations</li> </ul>
			GRAPHMATICA
	Applications to Business and	Week 6 - 7	Identification and
	Economics		construction of demand and
	3.1 Demand and Supply Functions		supply functions
	3.2 Market Equilibrium		Assessment of the
	3.3 Break-Even Analysis		corresponding market
			equilibrium point
			Identification and
			construction of the total cost,
			total revenue and profit

		functions Assessment of the
		corresponding break-even
		point
		Visual representations
		through manual
		computations and
		GRAPHMATICA
Quiz 2	Week 7	
Limits, Continuity and Derivatives	Weeks	Visual representations
4.1 The Concept of the Limit	8 - 10	through manual
4.2 Rules for Evaluating Limits		computations and
4.3 One-Sided Limits		GRAPHMATICA
4.4 Continuity of A Function		
4.5 The Derivative of a Function		Algebraic assessment
4.6 Rules for Differentiation		through manual
4.7 Derivatives of Exponential and		computations
Logarithmic Functions		
4.8 Higher Order Derivatives		
4.9 Implicit Differentiation		
Quiz 3	Week 10	
Applications of the Derivative to	Weeks	Determine and interpret the
Business and Economics	11 - 13	corresponding marginal
5.1 Marginal Analysis		functions, particularly when
5.2 Relative Maximum and Minimum Values of a Eurotion		applied to certain values
5.3 Absolute Maximum and		Determine and interpret
Minimum Values on Closed		optimal solutions to related
Interval		business functions
5.4 Applications of Absolute		
Extrema		
5.5 Concavity and Point of		
 Inflection Final Examination	Mook 14	
Final Examination	vveek 14	

## References

Daus, P.H. and Whyburn, W.M. (1965) Introduction to Mathematical Analysis: With applications to Problems of Economics. Reading: Addison-Wesley Pub.

Haeussler Jr., E.F. and Paul, R.S. (1976) Introductory Mathematical Analysis for Students of Business and Economics. Reston, VA: Reston Publishing.

Hoffman, L.D. and Bradley, G.D. (2010) *Calculus for Business, Economics and the Social and Life Sciences* (10<sup>th</sup>ed). Boston: McGraw-Hill Higher Education

Huettenmueller, Rhonda (2006) Business Calculus Demystified : [A Self-teaching Guide] /.Publication Info. New York : McGraw-Hill

Ruivivar, L. A., Lim, Y. F. ,(2011) Essential Calculus with Business Applications , Abiva Publishing House Inc. Quezon City , Philippines

Tan, Soo T. (2012) Applied Calculus for the Managerial, Life, and Social Sciences : A Brief Approach, Australia : Brooks/Cole Cengage Learning

Waner, Stefan, Costenoble, Steven R. (2007) Applied Calculus,. Belmont, CA : Thomson Brooks/Cole.

Tan, S.T. (2006) Calculus for the Manegerial, Life, and Social Sciences (7<sup>th</sup>ed).Singapore: Thomson-Brooks/Cole

Weber, J.E. (1982) Mathematical Analysis: Business and Mathematical Applications (4<sup>th</sup>ed). Quezon City: JMC Press

Vallar Jr., G.A. and Torres, H.D.(1984) Calculus and Analytic Geometry for Business and Economics. Manila: National Bookstore

## Online Resources

Free Calculus Tutorials and Problems Accessed October 11, 2012 from <u>http://analyzemath.com/calculus/</u> Visual Calculus Accessed October 11, 2012 from <u>http://archives.math.utk.edu/visual.calculus</u> tutorial.math.lamar.edu

Dawkins, P. (2012) Paul's Online Math Notes Accessed October 11, 2012 from http://tutorial.math.lamar.edu

#### Class Policies

- 1. The required minimum number of quizzes for a 3-unit course is 3, and 4 for 4-unit course. No part of the final exam may be considered as one quiz.
- 2. Cancellation of the lowest quiz is not allowed even if the number of quizzes exceeds the required minimum number of quizzes.
- 3. As a general policy, no special or make-up tests for missed exams other than the final examination will be given. However, a faculty member may give special exams for:
  - A. approved absences (where the student concerned officially represented the University at some function or activity).
  - B. absences due to serious illness which require hospitalization, death in the family and other reasons which the faculty member deems meritorious.
- 4. If a student missed two (2) examinations, then he/she will be required to take a make up for the second missed examination.
- 5. If the student has no valid reason for missing an exam (for example, the student was not prepared to take the exam) then the student receives 0% for the missed quiz.
- 6. Students who get at least 89% in every quiz are exempted from taking the final examination. Their final grade will be based on the average of their quizzes and other prefinal course requirements. The final grade of exempted students who opt to take the final examination will be based on the prescribed computation of final grades inclusive of a final examination. Students who missed and/or took any special/make-up quiz will not be eligible for exemption.
- 7. Learning outputs are required and not optional to pass the course.
- 8. Mobile phones and other forms of communication devices should be on silent mode or turned off during class.
- 9. Students are expected to be attentive and exhibit the behavior of a mature and responsible individual during class. They are also expected to come to class on time and prepared.
- 10. Sleeping, bringing in food and drinks, and wearing a cap and sunglasses in class are not allowed.
- 11. Students who wish to go to the washroom must politely ask permission and, if given such, they should be back in class within 5 minutes. Only one student at a time may be allowed to leave the classroom for this purpose.
- 12. Students who are absent from the class for more than 5 meetings will get a final grade of 0.0 in the course.
- 13. Only students who are officially enrolled in the course are allowed to attend the class meetings.

Approved by:

## DR. ARTURO Y. PACIFICADOR, JR.

Chair, Department of Mathematics