DE LA SALLE UNIVERSITY
College of Science
Department of Mathematics

ITMATH2 – *Basic Calculus with Business Applications (for BS IT Students)*
Prerequisite: ITMATH1   *Prerequisite to:*

Instructor:_____   Contact details:_____
Consultation Hours:_____   Class Schedule and Room:_____

Course Description

Designed for Information Technology 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 Attributes (ELGA)

ELGA	Learning Outcome
Critical and Creative Thinker Effective Communicator Lifelong Learner Service-Driven Citizen	At the end of the course, the student will be able to apply limits, continuity and differentiation in solving various conceptual and real-world problems in business and economics.

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 able to apply limits, continuity and differentiation in solving various conceptual and real-world problems in business and economics.	Collaborative activity on sketching the graph of conic sections and other functions using graphmatica software.	End of 7th week
	Give at least 2 real life business applications of mathematical concepts learned.	1 week before final exam

Rubric for assessment

CRITERIA	Excellent (4)	Good (3)	Satisfactory (2)	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

	FOR EXEMPTED STUDENTS (w/out Final Exam)	FOR STUDENTS with FINAL EXAM	
		with no missed quiz	*With one missed quiz*
Average of quizzes & Project	90%	60%	50%
Seatwork, Assignment, Learning Output	10%	10%	10%
Final exam	-	30%	40%

Scale:

95-100%	4.0
89-94%	3.5
83-88%	3.0
78-82%	2.5
72-77%	2.0
66-71%	1.5
60-65%	1.0
<60%	0.0

Learning Plan

LEARNING OUTCOME	TOPIC	WEEK NO.	LEARNING ACTIVITIES
	Functions and Their Graphs 1.1 Functions 1.2 The Graph of a Function 1.3 Linear Functions (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	Weeks 1 - 3	Graphs of functions and their domain and range through: • Manual computations • GRAPHMATICA
	Quiz 1	Week 3	
	Quadratic Equations in Two Variables 2.1 Parabola 2.2 Ellipse 2.3 Circle 2.4 Hyperbola	Weeks 4 - 5	General and standard forms of the quadratic equation in two variables, and their corresponding conic sections through: • Manual computations • GRAPHMATICA
	Applications to Business and Economics 3.1 Demand and Supply Functions 3.2 Market Equilibrium 3.3 Break-Even Analysis	Week 6 - 7	Identification and construction of demand and supply functions Assessment of the 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 4.1 The Concept of the Limit 4.2 Rules for Evaluating Limits 4.3 One-Sided Limits 4.4 Continuity of A Function 4.5 The Derivative of a Function 4.6 Rules for Differentiation 4.7 Derivatives of Exponential and Logarithmic Functions 4.8 Higher Order Derivatives 4.9 Implicit Differentiation	Weeks 8 - 10		Visual representations through manual computations and GRAPHMATICA Algebraic assessment through manual computations
	Quiz 3	Week 10		
	Applications of the Derivative to Business and Economics 5.1 Marginal Analysis 5.2 Relative Maximum and Minimum Values of a Function 5.3 Absolute Maximum and Minimum Values on Closed Interval 5.4 Applications of Absolute Extrema 5.5 Concavity and Point of Inflection	Weeks 11 - 13		Determine and interpret the corresponding marginal functions, particularly when applied to certain values Determine and interpret optimal solutions to related business functions
	Final Examination	Week 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 (10thed).* 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* (7thed).Singapore: Thomson-Brooks/Cole

Weber, J.E. (1982) *Mathematical Analysis: Business and Mathematical Applications (4thed).* 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 http://analyzemath.com/calculus/

Visual Calculus Accessed October 11, 2012 from http://archives.math.utk.edu/visual.calculus
     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