DE LA SALLE UNIVERSITY
College of Science
Department of Mathematics

ADVACAL – *Advanced Calculus 1*
Prerequisite: MATH116   *Prerequisite to:*

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

Course Description

This course covers the real number system as a complete, ordered field. It discusses topological properties of the Euclidean n-space, limits and continuity, sequences of constants, and sequence of functions.

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	Upon completing this course the student should be able to clearly discuss what this course is about, both in itself and relative to other courses taken.

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
Upon completing this course the student should be able to clearly discuss what this course is about, both in itself and relative to other courses taken.	A written report based on group discussions with classmates on the nature of the course	Week 12

Rubric for assessment

CRITERIA	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
Content and Organization (60%)	In-depth and insightful discussion in addition to score 3 performance	Logical sequencing of information throughout Sufficient supporting details Clear and effective concluding paragraph	Logical sequencing of information most of the time Details are given but inadequate to support the topic Clear concluding paragraph but lacks effectiveness	Information presented with little organization Most of the details irrelevant Concluding paragraph not clear
Grammar (30%)		No error	Between one and three errors	More than four errors
Bibliography (10%)		All resources cited	Some of the resources not cited	Majority of the resources not cited

Additional Requirements

•3 quizzes
•Final Exam

Grading System

	FOR EXEMPTED STUDENTS (w/out Final Exam)	FOR STUDENTS with FINAL EXAM	
		with no missed quizzes	*with one missed quiz*
Average of quizzes	90% / 95%	60% / 65%	50% / 55%
Other requirements	10% / 5%	10% / 5%	10% / 5%
Final exam		30 %	40%

The final output is worth 5% and will be added to the final course grade.

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
Upon completing this course the student should be able to clearly discuss what this course is about, both in itself and relative to other courses taken.	Basic concepts of set theory	1	Discuss basic concepts from set theory including functions and cardinality.
	The Field axioms	2	Discuss the key properties that define the field of real numbers.
	The Order Axioms	3	
	The Completeness Axiom	3-4	
	Quiz 1	4	
	The space R^n and some properties	5	Define the Euclidean n-space
	The norm on R^n and some topological properties	5-6	Discuss basic topological properties of R^n.
	Sequences in R^n	6-7	Discuss sequences in R^n and relate them to sequences in R.
	Sequences in R	7-8	
	Quiz 2	9	
	Limits of functions	9	Define limits and discuss its properties.
	Continuous functions	10	Define continuity and discuss some characterizations of continuous functions.
	Uniform continuity	11	Compare continuity and uniform continuity.
	Quiz 3	11	
	Differentiation and differentiation formulas	12	Review and discuss the derivative and differentiation formulas including the chain rule.
	Mean Value Theorems and L'Hopital's rule	13	

References

Trance, Aurora S., and Butiong R., *Introduction to Advanced Calculus*
Buck, C.R (1978). Advanced Calculus, (3rd edition) New York: McGraw-Hill
Bartle R.G.(1976).*The Elements of Real Analysis*. New York:Wiley
Rudin W., (1964). *Principles of Mathematical Analysis .(2nd edition).,*New York :Mcgraw-hill
Fitzpatrick P.M. (2006), *Advanced Calculus, 2nd Edition* Belmont, CA: Thomson Brooks/Cole
Folland G.B.,(2002) *Advanced Calculus* New Jersey: Prentice Hall
Schroder Bernd Siegfried (2008).*Mathematical Analysis: A Concise Introduction.* Hoboken, N.J.: Wiley - Interscience

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