

COURSE SYLLABUS

Course Number *Ma 21*

Title *Mathematical Analysis I*

Department/Program *Mathematics*

School *Science and Engineering*

Semester *First School Year* *2008-2009*

Instructor

Credit: *6 units*

Pre-requisites: *Ma 18a, Ma18b*

A. Course Description

Ma 21 is the first of a series of 3 calculus courses. Its main focus is differential and integral calculus of functions of one variable. Analysis and reasoning in mathematics are stressed and hence, emphasis is placed on the formal statement of definitions and proofs of the different theorems presented in the course.

B. Course Objectives

At the end of the course, the student should be able to

1. Prove the limit of a function using the definition.
2. Evaluate the limit of a function using the limit theorems.
3. Define continuity at a point and on an interval.
4. Use the definition to get the derivative of a function.
5. Differentiate sums, products, and quotients of functions.
6. State and apply the Mean Value Theorem and its corollaries.
7. Apply the derivative tests for maxima/minima.
8. State and apply the fundamental theorems of calculus.
9. Compute antiderivatives of various functions.
10. Compute the areas of regions and volumes of solids of revolution.
11. Define the logarithmic and exponential functions, inverse trigonometric functions and apply the related differentiation and integration formulas.
12. Relate the polar and Cartesian coordinate systems, sketch the graphs of polar equations and find the area of regions of intersections.

C. Course Outline and Timeframe

Topics	Sections in the Textbook	Suggested Pace (in weeks)
1. Limits and Continuity Long Exam 1 (100 pts.) June 26 (Thu)	1.4 to 1.10	2
2. Derivatives Long Exam 2 (100 pts.) July 15 (Tue)	2.1 to 2.10 (except 2.3)	2½
3. Applications of Derivatives Long Exam 3 (100 pts.) Aug 5 (Tue) Midterm Exam (200 pts.) Aug 7 (Thu)	3.1 to 3.10 (3.10 Differentials only)	2½
4. Definite Integral and Area Long Exam 4 (100 pts.) Aug 28 (Thu)	4.1 to 4.8 4.5 Supplement	2½
5. Volumes, Logarithmic and Exponential Functions Long Exam 5 (100 pts.) Sept 16 (Tue)	4.9 to 4.10 5.1 to 5.6	2½
6. Inverse Trigonometric Functions, Hyperbolic Functions; Polar Graphs Long Exam 6 (100 pts.) Oct 2 (Thurs) Final Exam (200 pts.) October 6-11	5.7 to 5.9, 9.3, 9.4 (9.4 not including length of Arc)	2

Expected Holidays/Special Events:

June 12	Thu	9:00 am	Mass of the Holy Spirit
June 20	Fri	Whole day	Faculty Day
July			Mass in honor of the Feast of St. Ignatius
July 31	Thu		School Holiday (Feast of St. Ignatius)
August 19	Tue		Quezon City Day
August 21	Thu		Special Holiday (not sure if working or non-working)

D. Required Readings (TextBook)

1. Leithold, Louis, *The Calculus* 7, Harper Collins, 1996

E. Suggested Readings (References)

1. Edwards, Jr., C.H. and Penney, E., *Calculus*, 6th Edition, Prentice Hall, 2002.
2. Etgen, G., Salas, S. and Hille, E., *Calculus : One and Several Variables*, 10th Edition, John Wiley and Sons, Inc., 2007.
3. Stewart, James, *Calculus, Early Transcendentals*, 6th Ed., Brooks/Cole, 2007.
4. Strauss, M.J.Bradley, G.L. and Smith, K.J., *Calculus*, 3rd Edition, Prentice-Hall, 2002.
5. Thomas, G.B. and Finney, R.L., *Calculus and Analytic Geometry*, 9th Edition., Massachusetts : Addison-Wesley, 1996.

F. Course Requirements

1. There are 6 long exams worth 100 points each.
2. Quizzes and homework, if any, altogether make up at most 100 points.
3. Laboratory exercises will not exceed 50 points.
4. Midterm and final exams are departmental exams and are worth 200 points each.
5. In the computation of the final marks, the score of the lowest long exam will be cancelled; the midterm and final exam scores are non-cancellable.
6. A student with a class standing of at least 90% prior to cancellation may be exempted from taking the final exams. Should the student be exempted, the class standing before the final exam will be his final grade.
7. No make-up Quizzes and Assignments.
8. Make-up for missed long tests may be given for valid reasons (serious sickness, games and competitions) as indicated in the Student Handbook. A letter from the Associate Dean for Academic Affairs must be presented.

G. Grading System

6 Long Exams (100 pts. each) <i>(Lowest Exam cancelled)</i>	[500]
Midterm and Final Exams <i>(200 pts each)</i>	[400]
Quizzes <i>(max 50 pts.)</i>	[50]
Homeworks <i>(max 50 pts.)</i>	[50]
Lab Quizzes <i>(max 50 pts)</i>	[50]
Final Grade = $\frac{\text{Total Score} * 100\%}{1050}$	

Letter Equivalence of Grades:	
92 - 100	A
86 - 91	B+
77 - 85	B
69 - 76	C+
60 - 68	C
50 - 59	D
below 50	F

H. Classroom Policies (To be given by the teachers)

I. Consultation Hours (To be given by the teachers)