



**ATENEO DE MANILA
UNIVERSITY**
Loyola Schools

**SYLLABUS FOR UNDERGRADUATE COURSES
MAJOR, CORE CURRICULUM and ELECTIVES**
Student Copy

A. COURSE INFORMATION

COURSE NUMBER	MATH 31.3	NO. OF UNITS	3
COURSE TITLE	Mathematical Analysis II		
PREREQUISITE/S	MATH 31.1 & 31.2		
DEPARTMENT/ PROGRAM	MATHEMATICS	SCHOOL	SOSE
SCHOOL YEAR	2021-2022	SEMESTER	1 ST
INSTRUCTOR/S	Reginaldo Marcelo		
VENUE/PLATFORM	Canvas	SECTION	G
		SCHEDULE	1230-1400 TTH

B. COURSE DESCRIPTION

This course is the second of a series of calculus courses. The major topics covered in the course are indeterminate forms and l'Hospital's Rule, improper integrals, sequences and series of numbers, power series, and calculus of functions of two or more variables.

WHERE IS THE COURSE SITUATED WITHIN THE FORMATION STAGES IN THE FRAMEWORK OF THE LOYOLA SCHOOLS CURRICULA	
	FOUNDATIONS: Exploring and Equipping the Self
✓	ROOTEDNESS: Investigating and Knowing the World
	DEEPENING: Defining the Self in the World
	LEADERSHIP: Engaging and Transforming the World

C. COURSE LEARNING OUTCOMES

By the end of this course, students should be able to:

COURSE LEARNING OUTCOMES
CLO1: (K) identify the different indeterminate forms and appropriately use l'Hospital's Rule to evaluate limits;
CLO2: (S) apply appropriate integration techniques to evaluate improper integrals
CLO3: (K, S) discuss the convergence of sequences, series, and power series
CLO4: (K, S) perform the power series expansion of an analytic function
CLO5: (K, S) solve optimization problems involving multivariate functions using partial derivatives and the method of Lagrange multipliers
CLO6: (S, A) compute double integrals
CLO7: (C) exemplify the discipline of constructing comprehensive and organized solutions for a given problem
CLO8: (C) adapt the different definitions and results in calculus to solve various problems

D. COURSE OUTLINE and LEARNING HOURS

Course Outline The section/s in parenthesis refers to the section in the textbook.	CLOs	Estimated Learning Hours
1a. Indeterminate Forms and l'Hospital's Rule (Section 6.8)	CLOs 1,7	5
1b. Improper Integrals (Section 7.8)	CLOs 2,7	5
2. Infinite Sequences and Series (Sections 11.1-10)	CLOs 3,4,7	23
Test #1 tentative sched: Oct 21 (Th) 5-6:30 pm		
3a. Functions of Several Variables (Section 14.1)	CLOs 5,6,7	2
3b. Limits and Continuity (Section 14.2)	CLOs 5,6,7	3
4a. Partial Derivatives (Section 14.3)	CLOs 5,7	2
4b. The Chain Rule (Section 14.5)	CLOs 5,7	3

5. Optimization of Functions of Several Variables (Sections 14.7 – 14.8)	CLOs 5,7,8	10
6. Double Integrals (Sections 15.1 – 15.2) + 15.3 (if time permits)	CLOs 6,7	7.5
Test #2 to be scheduled between Dec 9-18		

E. ASSESSMENTS AND RUBRICS

Assessment Tasks	Assessment Weight	CLOs
2 Departmental Tests	70%	CLOs 1-8
2 Problem Sets + 2 Quizzes	30%	CLOs 1-8

RUBRICS: (There will be a marking scheme in each assessment task.)

NOTES:

- The two departmental tests will have equal weight (35% of the final grade each). Test #1 will cover topics from Modules 1 and 2 while Test #2 will cover the rest of the topics.
- Each problem set and quiz will have the same weight (7.5% of the final grade). The problem sets will be assigned to groups of 3 to 4 members each. The groupings will be done at random and will be different in the three problem sets. The members should consult each other and decide on a single best answer per item; they should also decide on who among the members will upload their answers. Only one member needs to submit for the group. The questions will be made available one week before the due date. However, if you prefer to work on your own, email me by 5 pm of the last week day before the scheduled release of the problem set.
- The problem sets (for groups with more than 1 member) will have a peer/self evaluation component. Each one will be asked to grade oneself and the other group members from 0 to 100% as follows:
 - 92-100 = Excellent work; was crucial component to group's success
 - 77-91 = Very strong work; contributed significantly to group
 - 60-76 = Sufficient effort; contributed adequately to group
 - 50-59 = Insufficient effort; met minimal standards of group
 - 0-50* = Little or weak effort; was detrimental to group

If a group gets a raw score x (before the peer/self evaluation) and a student from this group gets an average of AVE from the self/peer evaluations, then the final grade of the student in this requirement will be $x \cdot \text{AVE}$.

- The answers to the problem sets and the tests will be uploaded in the Canvas course site. You may use a tablet or a computer to type your answers, or write them on A4 size paper. In any case, prepare them in portrait orientation, and combine in one pdf file with filename that starts with your family name (or the family names of the group members in the case of problem sets).
- Be aware of the deadline in submitting problem sets and tests. To avoid possible problems resulting from poor internet connection, don't wait for the last minute in uploading them. Late submissions will not be accepted. Especially for those with very limited internet bandwidth, experiment on how you can reduce the size of your files to upload. For example, don't include in the screenshot unnecessary elaborate design of the background (bed cover, table, etc).

- Participation in the course discussion boards---by posting a question or comment, or by reading someone else's post and replying to it, is highly encouraged. If a student's final numerical grade lands on the boundary of two letter grades, the participation in the discussion board may be used to determine the final letter grade.

F. TEACHING and LEARNING METHODS

TEACHING & LEARNING METHODS and ACTIVITIES	CLOs
Assigned readings and exercises	CLOs 1-8
Synchronous sessions (for lectures and discussion of problems)	CLOs 1-8
Recorded lectures/solutions of problems	CLOs 1-8
Discussion boards	CLOs 1-8

G. MAIN REFERENCE/REQUIRED READING

Stewart, J. et al. (2020), Calculus (Metric Version), 9th ed., Cengage Learning.

H. SUGGESTED READINGS

- Berresford, G. C. (2016). Applied Calculus, 7th ed. Boston, MA, USA: Cengage Learning.
- Goldstein, L. J. et al. (2019) Calculus & its Applications, 14th ed. NY, NY: Pearson.
- Hass, J. et al. (2018) University calculus: Early Transcendentals, 3rd ed. Harlow: Pearson Education Ltd.
- Hughes-Hallett, et al. (2015), Applied Calculus, 5th ed., Wiley.
- Larson, R. and Edwards, B. (2018). Calculus, 11th ed., Cengage Learning.
- Stewart, J. et al. (2021). Calculus: Early Transcendentals. Boston, MA, USA: Cengage.
- Stewart, J. (2019). Calculus: Concepts and Contexts, 4th ed. Boston, MA, USA: Cengage.
- Thomas, G. B., et al. (2014). Thomas' Calculus, 13th ed., Addison-Wesley.
- Thomas, G. B., et al. (2019). Thomas' Calculus: Early Transcendentals, 14th ed., Pearson.

I. GRADING SYSTEM

A student's final numerical grade is computed using the weight distribution of the different assessment tasks in Section E (Assessments and Rubrics). The numerical grade is then converted to a letter grade based on the following table:

92 – 100	A
86 – 91	B+
77 – 85	B
69 – 76	C+
60 – 68	C
50 – 59	D
Below 50	F

J. CLASS POLICIES

ON THE LMS CANVAS

- The class will be delivered online, using the LMS Canvas. For a tutorial on Canvas Basics specifically for LS, please go to this site: <https://sites.google.com/ateneo.edu/canvasbasicsbydiscs>. You may also visit the LS-One website (<https://sites.google.com/ateneo.edu/ls-one>) for information on anything that concerns student life at Ateneo.
- Check that you have the correct information in your account settings in Canvas, particularly on the following: complete name, obf email address, picture upload, time zone. Choose the appropriate

notification settings for announcements, grading of assessments, and others. Note that some images in Canvas may disappear if you are using Safari on MacBook or iPad. To avoid the problem, use Chrome or follow the instruction in <https://support.apple.com/en-ph/guide/safari/sfri40732/mac>; or if using Safari on iPad, view webpages privately.

3. A student with unstable or no internet connection may avail of the portable learning packet (PLP) that can be requested through LS One (www.ateneo.edu/lsone). Please inform the instructor as soon as possible, if you wish to avail of the PLP.
4. The materials posted in our Canvas course are meant for our course only. Do not share them in any other website or in social media, and with students who are not enrolled in the course.
5. All class announcements will be posted in Canvas between 8 am and 5 pm. Be aware of all deadlines and schedules.
6. Use the appropriate discussion board in Canvas for questions or other concerns that you think are of interest to other students also. Otherwise, you may email the instructor, or schedule a consultation; in the latter case, set an appointment at least one day in advance, and find another student who can be with you during the consultation.
7. When posting in discussion boards, please give your question/comment/response some thought. Avoid lengthy responses and don't click POST REPLY unless you have carefully reviewed your message.

ON ASSESSMENTS

1. In doing the problem sets and tests, the students are to work independently, and they are not allowed to communicate with anyone else other than the instructor and their group mates (only in the case of the problem sets).
2. The instructor will try to reply to posts/emails within 2 working days upon receipt, and to correct tests and other requirements within 2 weeks after the submission deadline. Students have two working days to report corrections/complaints in the checking, after the requirement is graded and is made available to the student.
3. The grades in Canvas are not official, so students are expected to keep a record of their scores.

ON SYNCHRONOUS SESSIONS

1. The class will hold synchronous sessions on days indicated in the schedule in Section L. The first session is particularly important, to discuss the syllabus, so students are expected to exert extra effort to be present. All sessions will be done via ZOOM, with the link posted in Canvas. They will be recorded so students who can't attend a session can watch the video later.
2. Even though we will try to discuss all the topics in the live sessions, don't rely completely on these sessions alone. The limited time will only allow us to cover the general concepts and discuss very few examples. To make the most of our time, please go over the modules in advance before attending each session.
3. In all live sessions, we will follow the standard practice during a video conference:
 - a) Stay in a quiet space, as much as possible. Use a headphone/earphone if it will help.
 - b) Be on time.
 - c) Please show yourself on the camera, so that the teacher can also get non-verbal feedback. Wear appropriate attire, have proper lighting, and look into the camera. But keeping cameras open is not required.
 - d) Keep your microphone off unless when you have permission to speak.
 - e) If you want to speak, send a chat message in the chat box, and wait until you are called.
 - f) The session will be recorded, so those who miss it can watch it later.

OTHERS

1. Students are expected to exercise the highest level of academic integrity. Cheating, plagiarism, discourtesy or misbehavior will not be tolerated and will be dealt with as stipulated in the Student Handbook.
2. Ateneo de Manila University does not discriminate on the basis of sex, gender, marital or parental status, sexual orientation, or gender identity or expression. Please see the following links: <http://www.ateneo.edu/ls/ls-gender-policy> and <https://www.ateneo.edu/policies/code-decorum-investigation-sexual-harassment>.
3. Within the first week of the semester, please fill up a personal information form in our course site in Canvas.
4. I will need the help of a beadle in doing some tasks such as
 - a) create and manage alternative platforms for purposes of communication and community
 - b) serve as liaison between the class and the instructor
 - c) remind the instructor to record synchronous class sessions
 - d) report class concerns to the department chair and School Dean (e.g., deviations from the syllabus, difficulties in contacting the instructor, etc.)

If anyone is willing and able to be the class beadle, please email me before our first meeting.

K. CONSULTATION HOURS

	EMAIL	DAY/S	TIME
Reginaldo Marcelo	rmarcelo@ateneo.edu	M ThF	3:00 – 5:00 pm 3:30 – 4:30 pm
		Or By Appointment	

L. ADDITIONAL NOTES

Tentative schedule of the course: (Please check Canvas for changes.)

		Aug 26 (Thu) S (Orientation, 6.8)	
Aug 31 (Tue) A (7.8)		Sep 02 (Thu) S (6.8, 7.8)	
Sep 07 (Tue) A (11.1, 11.2)		Sep 09 (Thu) S (11.1, 11.2)	
Sep 14 (Tue) A (11.3, 11.4)		Sep 16 (Thu) S (11.3, 11.4)	
Sep 21 (Tue) A (11.5, 11.6)		Sep 23 (Thu) S (11.5, 11.6)	
Sep 28 (Tue) S (11.3-11.6)		Sep 30 (Thu) A (11.8, 11.9)	
Oct 05 (Tue) S (11.8, 11.9)	Oct 06 (Wed) Quiz #1 (5-6 pm)	Oct 07 (Thu) S (11.9)	
Oct 12 (Tue) A (11.10)		Oct 14 (Thu) S (11.10)	Oct 15 (Fri) PS1 release (8 am)
Oct 19 (Tue) S (Test #1 review)		Oct 21 (Thu) A (14.1, 14.2) Test #1 (5-630 pm)	Oct 22 (Fri) PS1 due (5 pm)
Oct 26 (Tue) S (14.1, 14.2)		Oct 28 (Thu) S (14.2), A (14.3, 14.5)	
Nov 02 (Tue) S (14.3, 14.5)		Nov 04 (Thu) A (14.7)	
Nov 09 (Tue) S (14.7)		Nov 11 (Thu) A (14.8)	
Nov 16 (Tue) S (14.8)		Nov 18 (Thu) A (15.1, 15.2)	
Nov 23 (Tue) S (15.1, 15.2)		Nov 25 (Thu) A (15.3)	Nov 26 (Fri) PS2 release (8 am); Quiz #2 (630-730 pm)
Nov 30 (Tue) (holiday)		Dec 02 (Thu) S (15.3, Test #2 review)	Dec 03 (Fri) PS2 due (5 pm)
Dec 9-18: Test #2			

Note: S = Synchronous
A = Asynchronous