Course Syllabus

Course: Mathematics 3142.001.

Course Title: Advanced Calculus II.

How this course will be taught: This course will be taught synchronously throughout the semester during its regularly schedule time (lectures: TR 3:30-4:50 pm) using Zoom. The link to the Zoom meeting will be sent by e-mail. Attendance is required. All lectures will be recorded, and the link to the recording will be made available shortly after the end of the class.

Time: Lectures: TR 3:30-4:50 pm.

Place: All lectures and recitation will be held online via Zoom. The Zoom link will be sent by e-mail.

Instructor: Gerardo A. Mendoza.

Instructor Office: Wachman 618.

Instructor Email: gerardo.mendoza@temple.edu

Instructor Phone: 1-5053.

Course Web Page: http://math.temple.edu/∼gmendoza.

Office Hours: WF 11:00-12:00, plus TR:4:50-5:20. In additon also office hours by appointment, arranged one day in advance. Please do take advantage of the opportunity afforded by this flexibility.

Prerequisites: Math 3141 with a minimum grade of C^-.

Textbook:
Main textbook:
William F. Trench, Introduction to Real Analysis, online at
http://ramanujan.math.trinity.edu/wtrench/texts/trench_real_analysis.pdf
Additional resource:
Jiří Lebl, Basic Analysis I, online at
https://www.jirka.org/ra/realanal.pdf
Optional:
Jerrold E. Marsden and Michael J. Hoffman, Elementary Classical Analysis, 2nd ed, W. H. Freeman and Co, 1993.

Technology specifications for this course: A working computer with a reliable internet connection, a Webcam, and audio capability. Recommended Internet Speed: 8mbps download & 5mbps upload. You can test your connection at https://www.speedtest.net. Please note: Hard-wired connections are more consistent than Wi-Fi for Zoom sessions. A scanning app such as AdobeScan or CamScanner is required as is access to Zoom and Canvas (the Canvas app is also recommended). Limited resources are available for students who do not have the technology they need for class. Students with educational technology needs, including no computer or camera or insufficient Wifi-access, should submit a request outlining their needs using the Student Emergency Aid Fund form. The University will endeavor to meet needs, such as with a long-term loan of a laptop or Mifi device, a refurbished computer, or subsidized internet access.

Course Goals: This is the second semester of a year-long course in analysis. By the end of the second semester you should have acquired a rigorous foundation of topics such as limits, infinite series, continuity, differentiation and integration within the context of $\mathbb{R}^n$. In addition, you should gained additional knowhow, through practice, in writing down reasonably rigorous and clearly written proofs in real analysis.

How to get there: It is of fundamental important that you attend classes (I know you do, but I have to say it) and keep up with the material. Doing weekly homework will help you maintain discipline. Do not be afraid to ask questions: I expect them, after all, you are learning; take advantage of me being there. Keep in mind that your teachers are there to help you. But learning is something only you can do.

When writing up your homework, take the point of view that what you are doing is explaining your ideas to someone (and not to me). Think: is this a clear, convincing argument? Would my classmates be able to follow me? Doing this when you write your final version of the homework will help you clarify your own ideas. And please, do not hand in 'first drafts.' That does not help you (or me).

Topics Covered: The functions sin, cos, log (i.e. ln) and the exponential function. Taylor's theorem, analyticity, products of series of real numbers. The space $\mathbb{R}^n$ as a metric space, open sets, sequences, Bolzano-Weierstrass and Heine-Borel theorems in $\mathbb{R}^n$. Real-valued functions, continuity, differentiability, chain rule, Taylor's theorem, analyticity. Transformations of $\mathbb{R}^n$, the Inverse and Implicit Function theorems. Multiple integrals, Fubini's theorem, changes of variables, surface integrals, Stokes' theorem. Spaces of functions, metric spaces.

Course Grading: The grade will be heavily tilted towards homework (80%). Please keep up with the homework. There will be no midterm exams, but there will be a final, take-home exam (20%) due at the end of the officially scheduled final exam time for this course. In addition there will be a final individual interview, after the final exam.

Exam Dates: We will have no midterm exams. Instead, you are required to do the homework. The final exam will be a take-home exam. In all cases your work will be judged according to quality of your mathematical arguments, writing, and (written) presentation. The homework problems (typically not from the book) will be posted once per week. I'll send e-mail as soon as it becomes available. They will be due the following week, the specific due date will be included in the posted list of problems.
All submissions should be done via e-mail, only pdf format is acceptable; use a scanning app such as AdobeScan to scan your work.

Remote proctoring statement: Zoom, Proctorio or a similar proctoring tool may be used to proctor exams and quizzes in this course. These tools verify your identity and record online actions and surroundings. It is your responsibility to have the necessary government or school issued ID, a laptop or desktop computer with a reliable internet connection, the Google Chrome and Proctorio extension, a webcam/built-in camera and microphone, and system requirements for using Proctorio, Zoom, or a similar proctoring tool. Before the exam begins, the proctor may require a scan of the room in which you are taking the exam.

Attendance Policy: Attendance to all lectures is required. If you miss a lecture, please get in touch with classmate for notes and additional information.

The University's attendance policy[1] has been standardized to accommodate students who are ill or are required to self-quarantine for a period of time due to the COVID-19 pandemic.

To achieve course learning goals, students must attend in-person classes, and/or participate in classes or portions of classes that are taught remotely, to the extent that they are able. Though increased flexibility will be granted, in all cases, course assessments such as assignments, tests and exams must be completed for learning goals to be reached.

In order to facilitate contact tracing, instructors are required to ensure that attendance is recorded for each in-person meeting using an online attendance system designated by the university. Students who are exhibiting symptoms such as cough, fever, shortness of breath, muscle or body aches, headache, chills, sore throat, congestion, or new loss of taste or smell, or who have been in close contact with others who have symptoms, or who are engaging in self-quarantine at the direction of the Philadelphia Health Department, Student Health Services, or any healthcare

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[1]https://tuportal5.temple.edu/html/TEMPLE/apps/WSTF/TUP/Files/protocol-class-attendance.pdf

professional, should not attend in-person classes. Students will not be required to provide formal documentation from a healthcare provider for COVID-related absences. For more information, see the Student Health Services COVID-19 site[2].

Expectations for Class Conduct: In order to maintain a safe and focused learning environment, we must all comply with the four public health pillars: wearing face coverings, maintaining physical distancing, washing our hands and monitoring our health.

It is also important to foster a respectful and productive learning environment that includes all students in our diverse community of learners. Treat your classmates and instructor with respect in all communication, class activities, and meetings. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an idea but you are not to attack an individual. Our differences, some of which are outlined in the University's nondiscrimination statement[3], will add richness to this learning experience.

Please consider that sarcasm, humor and slang can be misconstrued in online interactions and generate unintended disruptions. Profanity should be avoided as should the use of all capital letters when composing responses in discussion threads, which can be construed as "shouting" online. Remember to be careful with your own and others' privacy. In general, have your behavior mirror how you would like to be treated by others.

Online Classroom Etiquette: It is expected that each student attends every class on time for the full duration of each class and behaves, in the same professional manner, as if you are in a regular classroom. This refers in particular to your location and attire. It is not appropriate to eat a large meal, drink alcohol, smoke, or get up often during an online class.

Statement on recording and distribution of recordings of class sessions: Any recordings permitted in this class can only be used for the student's personal educational use. Students are not permitted to copy, publish, or redistribute audio or video recordings of any portion of the class session to individuals who are not students in the course or academic program without the express permission of the faculty member and of any students who are recorded. Distribution without permission may be a violation of educational privacy law known as FERPA as well as certain copyright laws. Any recordings made by the instructor or university of this course are the property of Temple University.

Any student who has a need for accommodations based on the impact of a documented disability or medical condition should contact Disability Resources and Services (DRS) in 100 Ritter Annex (drs@temple.edu; 215-204-1280) to request accommodations and learn more about the resources available to you. If you have a DRS accommodation letter to share with me, or you would like to discuss your accommodations, please contact me as soon as practical. I will work with you and with DRS to coordinate reasonable accommodations for all students with documented disabilities. All discussions related to your accommodations will be confidential.

Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02) which can be accessed here.

Students will be charged for a course unless dropped by the Drop/Add deadline date. Check the University calendar for exact dates.

During the Drop/Add period, students may drop a course with no record of the class appearing on their transcript. Students are not financially responsible for any courses dropped during this period. In the following weeks prior to or on the withdrawal date students may withdraw from a course

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[2]https://studenthealth.temple.edu/covid-19-information
[3]https://diversity.temple.edu

with the grade of "W" appearing on their transcript. After the withdrawal date students may not withdraw from courses. Check the University Calendar[4] for exact dates. (Policy # 02.10.14[5]).

The grade "I" (an "incomplete") is only given if students cannot complete the course work due to circumstances beyond their control. It is necessary for the student to have completed the majority of the course work with a passing average and to sign an incomplete contract which clearly states what is left for the student to do and the deadline by which the work must be completed. The incomplete contract must also include a default grade that will be used in case the "I" grade is not resolved by the agreed deadline. See the full policy[6].

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[4]http://www.temple.edu/registrar/documents/calendars/

[5]https://bulletin.temple.edu/undergraduate/academic-policies/withdrawal-policies/

[6]https://bulletin.temple.edu/undergraduate/academic-policies/incomplete-coursework/