

MTH 403: Real Analysis II

Semester 1, 2021-22

General information

Instructor: Dr. Kashyap Rajeevsarathy

Office: AB1-314

E-mail: kashyap@iiserb.ac.in

Venue:

- Google Classroom: hurgt6y
- Joining info: [Meet link](#)

Schedule: SLOT D (in [Time Table](#))

Day	Timing
Wednesday	10 am - 11 am
Thursday	10 am - 11 am
Friday	10 am - 11 am

Course Webpage: Click [here](#).

Course structure

Topics

- Vector-valued functions, continuity, linear transformations, differentiation, total derivative, chain rule

- Determinants, Jacobian, implicit function theorem, inverse function theorem, rank theorem
- Partition of unity, Derivatives of higher order
- Riemann integration in \mathbb{R}^n , differentiation of integrals, change of variables, Fubini's theorem
- Exterior algebra, simplices, chains of simplices, Stokes theorem, vector fields, divergence of a vector field, Divergence theorem, closed and exact forms, Poincaré lemma

Suggested references

1. James Munkres, Analysis on manifolds (1st ed.), Westview Press, 1997.
2. Michael Spivak, Calculus on manifolds: A Modern Approach To Classical Theorems Of Advanced Calculus, Taylor & Francis, 1971.
3. David Widder, Advanced calculus (2nd ed.), Prentice Hall India, 1973.

Course policies

Live interaction sessions

- Reading material and prerecorded video lectures will be posted at the Google Classroom portal every week (details above). It is your responsibility to check the portal for any updates (from my end) and come prepared for the interactive sessions.
- There will be up to 90 minutes of live interaction sessions every week during the scheduled lecture hours. These sessions will be primarily aimed at enhancing your conceptual understanding of the reading material and video lectures posted during the week. Therefore, you are advised to effectively use these sessions to clarify your doubts on the topics being covered.
- **Class participation will carry 10% weightage in your final grade. This is will be calculated based on the following parameters:**

- (a) **Attendance record (of classes/interaction sessions).**
 - (b) **General preparedness for classes/sessions.**
 - (c) **Interactivity and responsiveness during the classes/sessions.**
- If you face any difficulties in participating in the live interaction sessions due to limitations in internet connectivity, data availability (or coverage) or technology, please contact me immediately. I will try my best to provide additional help or make alternative arrangements for you. Note that all live sessions will be recorded and posted in the Google Classroom for the benefit of the students with poor internet/data connectivity.
 - Practice problems will be posted every week, which will be based on the topics covered during the week. It is highly imperative that you try solving these problems on your own, as many problems in the homework assignments and quizzes might be based on them.

Continuous assessments

Continuous assessment will carry 70% weightage in your final grade. This component of your grade will be computed based on your **best three performances in the four continuous assessments** that will be assigned (or administered) during the course of the semester.

Assignments

- **Up to four assignments will be given during the course of the semester. Your best performance in these assignments will count towards one continuous assessment.**
- These assignments will constitute select problems from the practice assignments.
- The problems to be turned in and the due dates will be posted on the Google Classroom. So it is your responsibility to regularly check the Google Classroom for any updates.
- If you must miss the due date (for genuine reasons), try turning in your assignment in advance, or write to me seeking an extension.

- The solutions should be turned in via email either as a typed document or as a scanned softcopy of handwritten solutions.
- Problems written should be legible and must clearly indicate the steps used to arrive at the solution.
- While you are encouraged to share and discuss ideas with your classmates, I would strongly caution you against copying solutions verbatim from your classmate/friend. **Please be warned that:**
 - (a) **Assignments with nearly identical solution will not be graded.**
 - (b) **If there is evidence that even a part of an assignment is copied (or plagiarized), the entire assignment will be given a score of zero.**

Quizzes

- **Up to three quizzes may be administered during the course of the semester which will count towards three continuous assessments.**
- The syllabuses for the quizzes will be announced in the Google Classroom.

Final assessment

The final assessment will carry 20% weightage in your final grade.

- The schedule for the final assessment will be as per the [academic calendar](#). The final assessment will be comprehensive possibly with more emphasis on topics covered in the second half of the course.
- The exact nature of this assessment will be announced in due course, as it will largely depend on the prevailing situation at that point in time. However, the final exam may also be hosted

General policies concerning assessment

- Quizzes and exams may be hosted on any online proctoring platform endorsed by the Institute. In such situations, students may be required to take the quiz while sitting in front of their computer webcams/mobile phone cameras during the entire duration of the examination.
- Books, notes, or electronic devices of any kind are strictly prohibited while taking tests (exams and quizzes). It is your ethical (and moral) responsibility to exercise honesty and integrity while taking them.
- When graded tests are returned, please check them carefully for any grading errors. All grading issues should be brought to my attention as soon as possible. Note that your scores are not renegotiable after the final grades are submitted.
- Do not make plans that might prevent you from taking any scheduled exam or quiz. If you have a justifiable reason for missing a scheduled test, you must contact me in advance to make an alternative arrangement.
- Strong disciplinary action will be initiated against students indulging in academic malpractices (or misconduct) during quizzes (or exams) which include any form of cheating, impersonation, copying, plagiarism, etc., as per the prevailing academic norms of the Institute available at: [Circular - Disciplinary actions for various acts of academic malpractices.](#)

Grading scheme

A total of 100 percentage points will be distributed as follows:

Component	Weightage
Class participation	10%
Continuous assessment	70%
Final assessment	20%