

Syllabus and course policy

MA642: Real Analysis -1 [3-1-0-8]

January – April 2023

Syllabus: Completeness properties of real numbers, countable and uncountable sets, cardinality. Norms and metrics: Metric spaces, convergence of sequences, completeness, connectedness and sequential compactness; Continuity and uniform continuity; sequences and series of functions, uniform convergence, equicontinuity, Ascoli's theorem, Weierstrass approximation theorem, power series. Calculus of functions of a real variable: Differentiability, Mean value theorems, Taylor's theorem. Calculus of functions of several real variables: Partial and directional derivatives, differentiability, Chain Rule, Taylor's theorem, Maxima and Minima, Lagrange multipliers, Inverse function theorem, Implicit function theorem. Multiple Integration: Fubini's Theorem, Line integrals, Surface integrals, Green, Gauss and Stokes theorems.

Texts/References:

1. J. E. Marsden and M. J. Hoffman, Elementary Classical Analysis, 2nd Edition, W. H. Freeman, 1993.
2. P. M. Fitzpatrick, Advanced Calculus, 2nd Edition, AMS, Indian Edition, 2010.
3. N. L. Carothers, Real Analysis, Cambridge University Press, Indian Edition, 2009.
4. W. Rudin, Principles of Mathematical Analysis, 3rd Edition, McGraw Hill, 1976.
5. Elias M. Stein and Rami Shakarchi, Real Analysis – Measure Theory, Integration, and Hilbert Spaces (Princeton Lectures in Analysis), 2005.

Instructor: Rajesh Srivastava

For any query/help, you feel free to meet me in my office (E1-208) / call me at 2630 / email me at rksri@iitg.ac.in

Note: Please regularly visit the course website https://www.iitg.ac.in/rksri/MA642_2023.htm to see an update about course materials.

Lectures: Classroom: 2102. Class timing: Wed (B slot, 08:00 to 08:55), Wed, Thu, Fri (G slot, 12:00 to 12:55).

Attendance: It is expected that you attend all the classes. A student will be debarred from appearing in the end semester examination of MA642 if her/his attendance falls below 75 percent and will be awarded an “F” grade in this course.

The mobile phone must be in switch-off mode during the class.

Grading: Relative grading will be done based on the total marks obtained in the quizzes, mid-semester exam, and end semester. Exams/quizzes will have the following weightages:

Details:	Quiz-I	MidSem	Quiz-II/Presentation	EndSem
Weightage	10%	30%	10%	50%
Exam Date	Decide during class	As per Acad. Sec. Schedule	It will be decided during class	As per Acad. Sec. Schedule
Duration	One hour	Two hours	One hour	Three hours

Syllabus for exams: Will be declared in the class.

Some Important Points:

1. No make-up exam will be held for the students who **miss a quiz** or **mid-semester** exam.

2. You are always encouraged to ask the instructor anything regarding this course, anywhere, and anytime. However, you are discouraged from meeting the instructor to clarify a doubt or to ask for a hint of some problem on the day of any exam.

3. Grades of MA642 will be made available to the students only through the Academic Section on the stipulated date. Please do not ask me to let you know the grades.
