Department of Mathematics
Indian Institute of Technology Delhi
MTL 100: Calculus - Course information

Class teachers*:

Name	Groups	Section code	Email
Prof. Debdip Ganguly	G1-5	MTL100E	debdipmath@gmail.com
Prof. Ekata Saha	G6-10	MTL100F	ekata@maths.iitd.ac.in
Prof. Surjeet Kaur	G11-15	MTL100G	surjeetkour@maths.iitd.ac.in
Prof. S. Sivananthan	G16-20	MTL100H	siva@maths.iitd.ac.in
Prof. Aparajita Dasgupta	G21-25	MTL100A	adasgupta@maths.iitd.ac.in
Prof. N. Shravan Kumar	G26-30	MTL100B	shravankumar@maths.iitd.ac.in
Prof. Amit Priyadarshi	G31-35	MTL100C	priyadarshi@maths.iitd.ac.in
Prof. Biplab Basak	G36-40	MTL100D	biplab@maths.iitd.ac.in

*More details can be found in the department website:
http://maths.iitd.ac.in/drupal/faculty

Course coordinator: Prof. S. Sivananthan

Course contents:

Sequences: Real number system, Archimedean Property, Sequences of real numbers: Definitions of sequence and convergence, bounded sequences, limit superior and inferior, Cauchy sequence.

Infinite Series: Series of real numbers, absolute and conditional convergence, comparison, Cauchy condensation, ratio, root tests, Dirichlet's and Abel's test for convergence.

Differential Calculus: Limits, continuity, uniform continuity, differentiability, mean value theorems, Taylor's theorem, Taylor's series, power series, maxima and minima.

Multivariable Differential Calculus: Functions of several variables, limits, continuity, differentiability, gradient, directional derivatives, chain rule, Taylor's theorem, Maxima & minima and method of Lagrange multipliers.

Definite Integral: Definition of Riemann integral, fundamental theorems, improper integrals of first and second kind, beta and gamma functions, applications to area and arc length.

Multivariable Integral Calculus: Double and triple integrals, Jacobian and change of variables formula. Applications to Area, Volume, Surface area and surface integrals. Vector Calculus: Vector fields, divergence and curl, line integrals, Tangents & Normals, Parametrization of curves and surfaces, Green, Gauss, Stokes theorems and applications.

Reference books:

1. K. A. Ross, Elementary Analysis: The Theory of Calculus, Springer (for single variable calculus)
2. G. B. Thomas and R. L. Finney, Calculus, Pearson (all topics)

Note: We recommend the students to read the above-mentioned reference books.
A hand-out lecture notes by Prof. K. Sreenadh can be found in the following link:
(http://web.iitd.ac.in/~sreenadh/MTL100/main.html).

Information about the class:

1. **Lectures:** Weekly four hours of recorded video lectures will be uploaded on the Impartus MTL100 page (Tuesday and Friday around 5-6pm). We will also upload the relevant tutorial problems and practice problems on the same page.
2. **Online interactive sessions and tutorials**: we will use MS teams**.**
3. **Online Interactive sessions:** We will conduct live interactive sessions to clarify your doubts on every **Tuesday and Friday** (if there is any change, the class teacher will inform you).
4. **Online Tutorial sessions:** As per institute schedule, we will conduct the tutorial sessions in live.
5. **We will use piazza for our class discussion:**
   Enroll for the same using the link: http://piazza.com/iitd.ac.in/spring2021/mtl100
   The access code for the class is "mtl100calculus"

Grading Policy:

There will be one minor examination of 30%, one major examination of 40%, and two quizzes which carry the remaining 30%(the weightage for the quiz will be announced later).

Tentative examination schedule:

Exam	**Date and time**	**Tentative syllabus**
Mock test	1st December (Tuesday) at 5:30 pm	NA
Quiz1	6th December (Sunday) at 2:30 pm	Sequence and series
Minor 1	December 27 – 30 (Refer to institute exam schedule)	Topics: Sequences, series and differential calculus(one variable)
Quiz 2	24th January (Sunday) at 2:30 pm	Multivariable differential calculus
Major	February 10 – 14 (Refer to institute exam schedule)	Entire syllabus

Important guidelines:

1. If you find any difficulty in the course, you should immediately inform your class teacher. So that we will do our best to help you on this.
2. You must **see the recorded lectures** before you come for the interactive sessions, so that the session will be helpful and useful for everyone.
3. If you have any problem with the **internet connection**, then you should report the issue to the UG administration immediately and inform the same to your class teacher.

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Tutorial teachers and schedule:

Class Teacher	Group No.	Tutorial Teacher	Time	Email Ids
Prof. Debdip Ganguly	1	Deepak Kumar	2:00-2:50 PM Monday	maz178297@iitd.ac.in
	2	Sushmita Rawat	2:00-2:50 PM Monday	maz198090@iitd.ac.in
	3	Prof. Debdip Ganguly	2:00-2:50 PM Tuesday	debdipmath@gmail.com
	4	Dr. Arvind Kumar	2:00-2:50 PM Tuesday	arv@maths.iitd.ac.in
	5	i. Divyam Gupta ii. Ajay Sailopal	2:00-2:50 PM Wednesday	mt1170287@iitd.ac.in mt1170726@iitd.ac.in
Prof. Ekta Saha	6	Dr. Surinder Kaur	2:00-2:50 PM Wednesday	surinderkaur@maths.iitd.ac.in
	7	Aakash Choudhary	2:00-2:50 PM Thursday	achoudhary1396@gmail.com
	8	i. Nikhil Kapoor ii. Manthan Kabra	2:00-2:50 PM Thursday	mt1170739@iitd.ac.in mt1170735@iitd.ac.in
	9	Prof. Ekta Saha	2:00-2:50 PM Friday	ekata@maths.iitd.ac.in
	10	Priyamvada	2:00-2:50 PM Friday	maz178310@iitd.ac.in
Prof. Surjeet Kaur	11	Dr. Surinder Kaur	2:00-2:50 PM Thursday	surinderkaur@maths.iitd.ac.in
	12	Soniya Takshak	2:00-2:50 PM Thursday	sntakshak9557@gmail.com
	13	Pooja	2:00-2:50 PM Friday	maz178433@iitd.ac.in
	14	Jyotshna Sharma	2:00-2:50 PM Friday	Sharmajyotsna1210@gmail.com
	15	i. Sumanth Varambally ii. Utkarsh Gupta	2:00-2:50 PM Monday	mt6170855@iitd.ac.in mt1170753@iitd.ac.in
Prof. Sivananthan Sampath	16	Himanshu Sharma	2:00-2:50 PM Monday	himanshusharma985@gmail.com
	17	Prof. Sivananthan Sampath	2:00-2:50 PM Tuesday	siva@maths.iitd.ac.in
	18	i. Yashank Singh ii. Shanmukhi Sripada	2:00-2:50 PM Tuesday	mt1170756@iitd.ac.in me1170158@iitd.ac.in
	19	Bhawna	2:00-2:50 PM Wednesday	tyms1996@gmail.com
	20	Dhiraj Patel	2:00-2:50 PM Wednesday	dpatel.iitd@gmail.com

Class Teacher	Group No.	Tutorial Teacher	Time	Email Ids
Prof. Aparajita Dasgupta	21	Abhilash Tushir	4:00-4:50 PM Friday	maz198077@iitd.ac.in
	22	Santosh Kumar Nayek	4:00-4:50 PM Friday	nayaksantosh212@gmail.com
	23	Dr. Arvind Kumar	4:00-4:50 PM Monday	arv@maths.iitd.ac.in
	24	Dr. Surinder Kaur	4:00-4:50 PM Monday	surinderkaur@maths.iitd.ac.in
	25	Prof. Aparajita Dasgupta	4:00-4:50 PM Tuesday	adasgupta@maths.iitd.ac.in
Prof. N. Shravan Kumar	26	Prof. N. Shravan Kumar	4:00-4:50 PM Tuesday	shravankumar@maths.iitd.ac.in
	27	Ritika Singhal	4:00-4:50 PM Wednesday	ritikasinghal1120@gmail.com
	28	i. Anchit Tandon ii. Sakshi Taparia	4:00-4:50 PM Wednesday	mt1170772@iitd.ac.in mt1170748@iitd.ac.in
	29	Dr. Arvind Kumar	4:00-4:50 PM Thursday	arv@maths.iitd.ac.in
	30	Aastha Agarwal	4:00-4:50 PM Thursday	asthaagrawal5796@gmail.com
Prof. Amit Priyadarsi	31	Prof. Amit Priyadarsi	11:00-11:50 AM Friday	priyadarshi@maths.iitd.ac.in
	32	Dr. Biswarup Biswas	11:00-11:50 AM Friday	biswarupb@maths.iitd.ac.in
	33	Manuj Verma	11:00-11:50 AM Monday	manujverma123@gmail.com
	34	Gyanendra Kumar Verma	11:00-11:50 AM Monday	352956@gmail.com
	35	Sachin	11:00-11:50 AM Tuesday	maz198086@iitd.ac.in
Prof. Biplab Basak	36	Prof. Biplab Basak	11:00-11:50 AM Tuesday	biplab@maths.iitd.ac.in
	37	Manisha Binjola	11:00-11:50 AM Wednesday	maz188449@iitd.ac.in
	38	Abhinay Kumar Gupta	11:00-11:50 AM Wednesday	iabhinay41@gmail.com
	39	Dr. Biswarup Biswas	11:00-11:50 AM Thursday	biswarupb@maths.iitd.ac.in
	40	Anshu Yadav	11:00-11:50 AM Thursday	maz178435@iitd.ac.in