

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Sequence

Sequence in X is a function $f: \mathbb{N} \rightarrow X$.

$x_n := f(n)$

$(x_n)_{n=1}^{\infty}$ or $\{x_n\}_{n=1}^{\infty}$ or (x_n)

Medidar sir

7 others

Saurabh S

People

Add people

- 48 Shivani varne
- Kishore Salunkhe
- Medidar sir
- minakshee dhaygude
- Pallavi Pawar
- Rutuja Kore
- Saurabh S Meeting host

19:15 | udx-bhxq-mfb

7:15 PM 2/6/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Sequence of functions :

Sequence of functions D is a function $F: \mathbb{N} \rightarrow X$

Where $X := \{f \mid f: D \rightarrow \mathbb{K}\}$.

$f_n := F(n)$

Sequence of functions on D is denoted by

$\{f_n\}_{n=1}^{\infty}$ or $(f_n)_{n=1}^{\infty}$ or (f_n)

$D \subset \mathbb{R}$ or $D \subset \mathbb{C}$ and $\mathbb{K} = \mathbb{R}$ or $\mathbb{K} = \mathbb{C}$

9 others

Saurabh S

19:08 | udx-bhxq-mfb

7:08 PM 2/7/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Let $\sum a_n$ be series of real numbers.
 $\sum a_n = a$ means $S_n \rightarrow a$

19:14 | udx-bhxq-mfb

7:15 PM 2/16/2025

Participants: Saurabh S, Rujuta Kulkarni, 6 others

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Problem 4: Let $\left\{ \frac{x^{2n}}{1+x^{2n}} \right\}$ be sequence of functions on $\mathbb{R}$, then find limit function.
Solⁿ:

19:04 | udx-bhxq-mfb

7:04 PM 2/8/2025

Participants: Saurabh S, 8 others

People

Add people

Search for people

IN MEETING

Contributors 10

Name	Role	Audio	Video
Saurabh S (You)	Meeting host	On	On
Bajirao Patil		Off	Off
Kishore Salunkhe		Off	Off
Rachana Bobade		Off	Off
Rutuja Kore		Off	Off

sheetal dhane has joined

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Theorem
 Assume $f_n \rightarrow f$ uniformly on S . If each f_n is cts at $c \in S$ then f is also cts at $c \in S$.

13 others

Saurabh S

People

Add people

- Rutuja Kore
- Saurabh S Meeting host
- Saurabh S Meeting host
- Sayali Pawar
- sheetal dhane
- Snehal Aadnaik
- sushil maske

18:54 | udx-bhxq-mfb

ENG IN 6:54 PM 2/9/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

but $\lim_{x \rightarrow \infty} f_{n+k}(x) = f(x), x \in S$
 $\Rightarrow \lim_{n \rightarrow \infty} |f_{n+k}(x) - f_n(x)| \leq \frac{\epsilon}{2}, x \in S$
 $\Rightarrow |\lim_{k \rightarrow \infty} f_{n+k}(x) - f_n(x)| \leq \frac{\epsilon}{2}, x \in S$
 $\Rightarrow |f(x) - f_n(x)| \leq \frac{\epsilon}{2} < \epsilon, x \in S$
 Thus we proved that for $\epsilon > 0, \exists N \in \mathbb{N}$ s.t if $n \geq N$ then
 $|f_n(x) - f(x)| < \epsilon, x \in S$
 i.e. $f_n \rightarrow f$ uniformly on S .

Saurabh S

Rutuja Kulkarni

12 others

20:03 | udx-bhxq-mfb

ENG IN 8:03 PM 2/12/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Label Contact Session-6

$$\lim_{n \rightarrow \infty} \int_a^b f_n(x) dx = \int_a^b f(x) dx$$

Uniform

$f_n \xrightarrow{\text{Uniform}} f$

R.I. C

R.I. C

20:24 | udx-bhxq-mfb

ENG IN

8:24 PM 2/13/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

$f_n \xrightarrow{\text{Uniformly}} f$

Cts Cts

R.I. R.I.

Diff. Diff. ?

$$\int_a^b f(x) dx = \lim_{n \rightarrow \infty} \int_a^b f_n(x) dx$$

$$\int_a^b \left(\lim_{n \rightarrow \infty} f_n(x) \right) dx = \lim_{n \rightarrow \infty} \int_a^b f_n(x) dx$$

19:07 | udx-bhxq-mfb

ENG IN

7:07 PM 2/14/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Problem: Prove that, if $\sum f_n$ is uniformly cgt on S then $f_n \rightarrow 0$ uniformly on S .

If $f_n \not\rightarrow 0$ uniformly then $\sum f_n$ is not uniformly cgt.

19:57 | udx-bhxq-mfb

People

- Dr Morkane
- Poonam Kanase
- Rujuta Kulkarni
- Saurabh S Meeting host
- Saurabh S Meeting host
- Snehal Aadnaik
- sushil maske

7:57 PM 2/15/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Label Contact Session-10

$$\begin{aligned}
 &= \lim_{n \rightarrow \infty} \left[\int_a^b f_1(x) dx + \int_a^b f_2(x) dx + \dots + \int_a^b f_n(x) dx \right] \\
 &= \lim_{n \rightarrow \infty} \left[\sum_{k=1}^n \int_a^b f_k(x) dx \right] \\
 &= \sum_{n=1}^{\infty} \int_a^b f_n(x) dx \\
 \therefore \int_a^b f(x) dx &= \sum_{n=1}^{\infty} \left(\int_a^b f_n(x) dx \right)
 \end{aligned}$$

19:48 | udx-bhxq-mfb

People

- Poonam Kanase
- Rachana Bobade
- Rutuja Kore
- Saurabh S Meeting host
- Saurabh S Meeting host
- Snehal Aadnaik
- sushil maske

7:48 PM 2/19/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Collection is denoted by $\mathcal{A}, \mathcal{B}, \dots$

Collection - Set of subsets of X

$\mathcal{P}(X) = \{$

19:11 | udx-bhxq-mfb

People

Add people

IN MEETING

Contributors 7

- Saurabh S (You) Meeting host
- Kishore Salunkhe
- minakshee dhaygude
- Rutuja Kore
- Saurabh S Meeting host

7:11 PM 2/20/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Topology

Lecture-2

Topological Spaces continued

Date: 20 February 2025

Time: 7:00 PM - 8:00 PM

Venue: Online <https://meet.google.com/udx-bhxq-mfb>

Mr. Saurabh Swami

Assistant Professor (CHB)

Department of Mathematics,

Miraj Mahavidyalaya, Miraj

19:07 | udx-bhxq-mfb

People

Add people

Search for people

IN THE MEETING

Contributors 6

- Saurabh S (You) Meeting host
- Devaki Bhosale
- jaysing jadhav
- omkar patil
- Saurabh S Meeting host

7:07 PM 2/22/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

topology

Problem: Let X be a set and

$$\mathcal{T}_f = \{A \subset X \mid A^c \text{ is finite or } A = X\}$$

Then prove that $\mathcal{T}_f$ is topology on X .

$A \in \mathcal{T}_f \iff A^c \text{ finite or } A = X$

19:10 | udx-bhxq-mfb

7:10 PM 2/23/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

$x \in B_x \subset B_1 \cap B_2$

Eg. Let $X = \mathbb{R}$. $\mathcal{D} = \{(a, b) \mid a, b \in \mathbb{R}\}$

Then $\mathcal{D}$ is basis for topology on X .

To prove i)

For any $x \in \mathbb{R}$.

19:22 | udx-bhxq-mfb

7:22 PM 2/24/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

$T = T'$

you have to prove $T \subset T'$ and $T' \subset T$.

Proof:

19:18 | udx-bhxq-mfb

People

Add people

Search for people

IN THE MEETING

Contributors 10

- Saurabh S (You) Meeting host
- Asshwni Chikhale
- Kishore Salunkhe
- Medidar sir
- minakshee dhaygude

7 others

7:18 PM 2/26/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

$T = T'$

$T' \subset T$

$T \subset T'$

$T = T'$

20:43 | udx-bhxq-mfb

People

Add people

- bhagyashri raut
- Devaki Bhosale
- Dr Morkane
- Rutuja Kore
- Saurabh S Meeting host
- shital kadam
- sushil maske

5 others

Microphone in use by: YouTube

8:43 PM 2/27/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

20:43 | udx-bhxq-mfb

Microphone in use by: YouTube

8:43 PM 2/27/2025

People

Add people

- bhagyashri raut
- Devaki Bhosale
- Dr Morkane
- Rutuja Kore
- Saurabh S Meeting host
- shital kadam
- sushil maske

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

20:09 | udx-bhxq-mfb

Microphone in use by: YouTube

8:09 PM 2/28/2025

People

Add people

Contributors 11

- Saurabh S (You) Meeting host
- Asshwni Chikhale
- Dr Morkane
- Kishore Salunkhe
- omkar patil
- Rachana Bobade
- Ruiuta Kulkarni

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

If $\mathcal{B}$ is basis for topology on X then

$$\mathcal{T} = \{U \subset X \mid \forall x \in U, \exists B_x \in \mathcal{B}, x \in B_x \subset U\}$$

is topology.

$\mathcal{T}$ is called topology generated by $\mathcal{B}$.

let $\mathcal{T}$ be topology on X generated.

19:16 | udx-bhxq-mfb

People

Add people

- Saurabh S (You) Meeting host
- Kishore Salunkhe
- Rachana Bobade
- Rutuja Kore
- Saurabh S Meeting host
- sushil maske
- Varshadevi Morkane

4 others

7:16 PM 3/1/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Sub-basis

19:13 | udx-bhxq-mfb

People

Add people

Search for people

IN THE MEETING

Contributors 6

- Saurabh S (You) Meeting host
- Dr Morkane
- Kishore Salunkhe
- Medidar sir
- Rujuta Kulkarni

3 others

7:13 PM 3/2/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Rujuta Kulkarni

Case II: x is largest.
 Since X contains more than one elements, $\exists b \in X$ s.t.
 $b < x$
 $\Rightarrow x \in (b, \infty) \in J^* - (b, \infty)$

Case III: x is neither smallest nor largest.
 $\Rightarrow \exists a, b \in X$
 Such that $a < x < b$
 $\Rightarrow x \in (a, b) \in J^*$

Saurabh S

Rujuta Kulkarni

8 others

People

Add people

- Rachana Bobade
- Rujuta Kulkarni
- Rutuja Kore
- Saurabh S Meeting host
- sheetal dhane
- shital kadam
- sushil maske

21:47 | udx-bhxq-mfb

ENG IN 9:47 PM 3/2/2025

Google Meet - Meet - udx-bhxq-mfb

Saurabh S (Presenting)

Rujuta Kulkarni

Case II: x is largest.
 Since X contains more than one elements, $\exists b \in X$ s.t.
 $b < x$
 $\Rightarrow x \in (b, \infty) \in J^* - (b, \infty)$

Case III: x is neither smallest nor largest.
 $\Rightarrow \exists a, b \in X$
 Such that $a < x < b$
 $\Rightarrow x \in (a, b) \in J^*$

Saurabh S

Rujuta Kulkarni

8 others

People

Add people

- Rachana Bobade
- Rujuta Kulkarni
- Rutuja Kore
- Saurabh S Meeting host
- sheetal dhane
- shital kadam
- sushil maske

21:47 | udx-bhxq-mfb

ENG IN 9:47 PM 3/2/2025