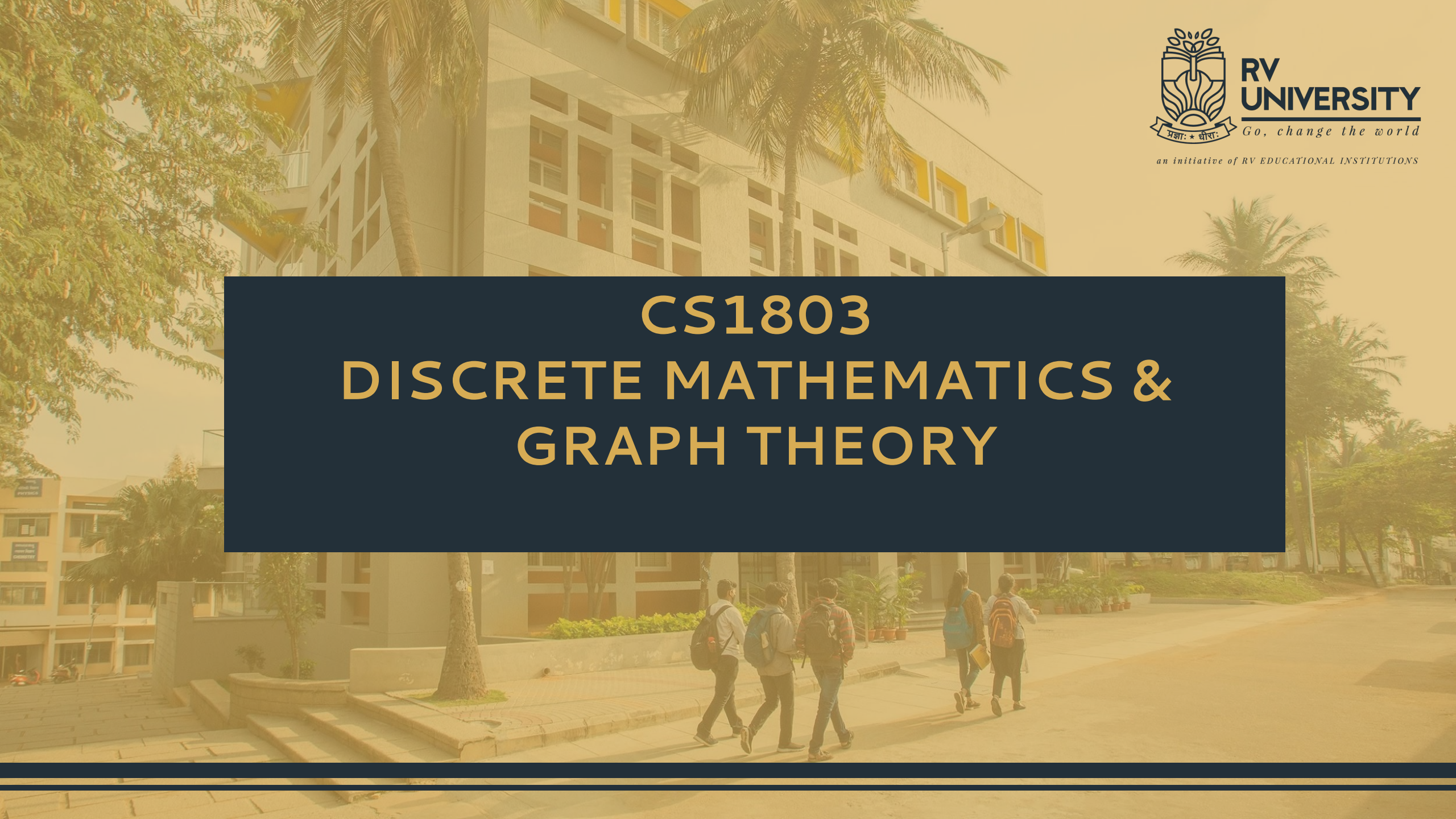

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CS1803
DISCRETE MATHEMATICS & GRAPH THEORY

Agenda

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- Introduction to sets
- Standard Notations
- Representation of Sets
- Intervals of Set
- Cardinality of Set
- Types of Set

Introduction

Definition : A set is a collection of discrete objects called elements.

Elements: Members of the set

The members of the set can be numbers, alphabets, names etc.
Eg: Set of Vowels, Set of positive integers, Set of Birds

Introduction to sets

A set can be represented in Uppercase Letters as ‘A’
Its elements can be represented in Lowercase Letters ‘a,b,c,d’

Eg: Set of vowels.
V = {a,e,i,o,u}
$a \in V$
$g \notin V$

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Standard Notations

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Notations	Explanation
$x \in A$	x belongs to A or x is an element of set A.
$x \notin A$	x does not belong to set A.
$\emptyset$	Empty Set.
U	Universal Set.
N	The set of all natural numbers.
I/ Z	The set of all integers.
Q	The set of all rational Numbers
C	The set of all Complex Numbers
R	The set of all Real Numbers

Representation of Sets

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Roaster Form	Set Builder Form
All the elements of the set will be listed with in { } and separated by “ ,“	The properties fulfilled by all elements of the set will be listed.
Eg: A= {2,4,6,8}	A = {2,4,8,16} A ={x : x=2^n , where n∈N and 1<=n<=5}

Intervals of sets

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Sets of all real numbers between two numbers a and b, with or without a and b. Intervals can be divided into two

Closed Interval	Open Interval
Denoted by [ ]	Denoted by ( )
It includes the end values	It Doesn't include the end values
[a,b] = includes both a and b	(a,b) = excludes both an and b

Cardinality of sets

Total number of unique elements in the set.

Eg: A = {a, b, c, d, a }
Cardinality = 4

Types of sets

1. Finite Sets
2. Infinite sets
3. Subset
4. Universal Sets
5. Proper Sets
6. Power Sets
7. Singleton set

Thank you

End of Module 1
Part 1