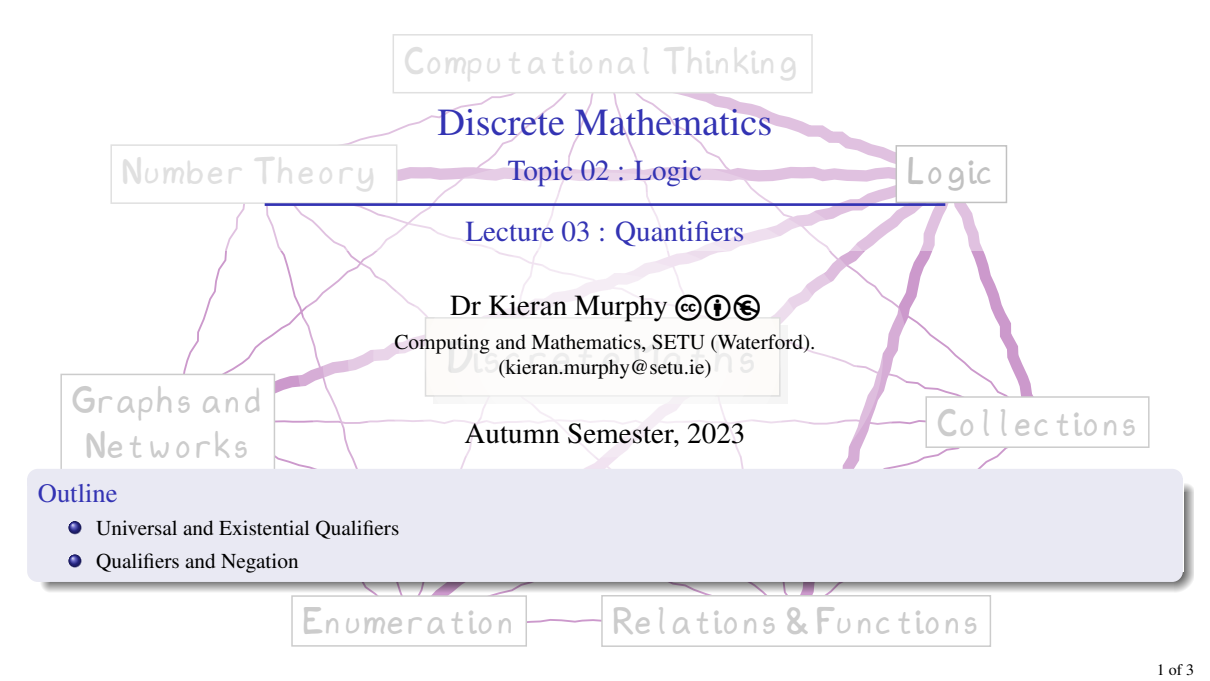

Discrete Mathematics

Topic 02 : Logic

Lecture 03 : Quantifiers

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Outline

- Universal and Existential Qualifiers
- Qualifiers and Negation

Outline

Motivation

Quantifiers are propositions about $\underbrace{\text{elements}}_{\text{students}}$ in a $\underbrace{\text{collection}}_{\text{class}}$.

Student *s* is wearing a hat

Universal "for all" $\forall$

All students in this class are wearing hats
$\forall s$ (this class) [Student s is wearing a hat]

To Prove: We NEED to check that proposition is **True** for EVERY element in the collection

To Disprove: We ONLY NEED find ONE EXAMPLE with proposition is **False**

Existence "there exists" $\exists$

At least one student in this class is wearing a hat
$\exists s$ (this class) [Student s is wearing a hat]

To Prove: We ONLY NEED find ONE EXAMPLE with proposition is **True**

To Disprove: We NEED to check that proposition is **False** for EVERY element in the collection