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| Code of course: **BMI-LOTD17-103E, BMA-LOTD17-103** |
| Title of course: **Foundations of Mathematics** |
| Lecturer: **Gopaulsingh Alexa Stephanie Maria** |
| **General aim of the course:**  To demonstrate the set theoretic build-up of the number systems  **Content of the course:**  Axioms of set theory; Russell's paradox; Relation, functions, equivalence classes and cartesian products; von Neumann construction of natural numbers, Properties of natural numbers, Peano axioms; Review of groups and group homomorphisms; Building the integers from the natural numbers; Building the Rationals from the Integers, Building the Reals from the Rationals using Dedekind cuts, Properties of Real numbers, Cardinality to measure size of sets, Properties of cardinality, Cantor–Schröder–Bernstein theorem.  Lastly if time permits, a session mentioning alternatives to set theory for a foundation of mathematics eg, Category theory, Mereology. A discussion on generalising size from finite collections to infinite collections using cardinality: What principle(s) about size do we give up when generalising cardinality from finite sets to infinite sets?  **Grading criteria, specific requirements:**  **Required reading:**  The Foundations of Mathematics by Ian Stewart and David Tall  **Further reading:**  Introduction to Metamathematics by Stephen Cole Kleene |