ITC8190
Mathematics for Computer Science
Introduction

Aleksandr Lenin

Objectives of the Course

- provide basic mathematical background that will help you learn cryptography courses

- ability to understand mathematical texts

- can understand and use mathematical language

Course Topics

1. Introduction (this lecture)
2. Sets and mappings between sets.
3. Relations on a set: equivalence and order relations.
4. Minimal/maximal, smallest/greatest elements, lower/upper bounds, supremum/infimum.
5. Infinte sets and their comparison. Various types of infinity.
6. Natural numbers and induction. Divisibility and prime numbers.
7. Elementary counting principles. Permutations and combinations.

Course Topics (contd.)

10. Probabilities. Random variables, mean and standard deviation.

11. Algebraic structures: groups, rings, integral domains, fields.

12. Recurrence relations and sums.

13. Polynomials and their roots.

14. Vector spaces. Linear maps. Matrices and matrix operations.

15. Real numbers. Sequences and convergence.

16. Continuous functions. Derivatives. Series. Integrals.

17. Computational complexity and $\mathcal{O}$-notation

Course organization

The course structured into 2 activity categories:

- Two individual assignments – 40%

- Examination 60%

Examination is pen and paper one. No written, printed or electronic materials are permitted.

Course organization

To pass the course, a student has to score at least 51% in every activity category.

Students who get less than 51% for individual assignments will not be admitted to the exam.

Suggested Reading

- Lecture slides

- Some additional reading material may be given at the end of a topic, if necessary.

Course Instructor

Aleksandr Lenin
email: `aleksandr.lenin@taltech.ee`

Course homepage:
`https://courses.cs.ttu.ee/pages/ITC8190` Consultation times

agreed via email.