**ОБЖ (Опыты Быстротекущей Жизни)**

**Знакомимся с математическими исследованиями**

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*Кто не был, тот будет.*

*Кто был – не забудет*

*(Народная мудрость)*

**Objectives**

***–*** to introduce important mathematical concepts (parametric curves, probability and expectation, finite automata, etc.);

***–*** to introduce the use of the Python language in real life through the experience of conducting research.

**Course style**

We will analyze and solve problems using programming in Python basically within Ipython notebook. Also we will find out what is Ipython notebook. We have a lot of content. The pace and the selection of content will depend on the participants. We will try to move quickly (one lesson - one subject).

**Content**

**A. Python**

1. Syntax basics (for those who already knows – you will go over and help others);
2. Libraries, modules, functions and how to use it;
3. Popular Python libraries (matplotlib, numpy, scipy, biopython, sklearn (if we have time).

**B. Math**

1) Curves and graphs. Definition of the curve on the plane as the trajectory of the point or as the velocity field (if we have time);

2) Numerical solution of the equations. Division of the segment in half. Newton's Method (if we have time);

3) Introduction to probabilities. Expected value. Random number generators (if we have time);

4) Finite Automata. Finite automata languages. Regular expressions (if we have time);

5) Hidden Markov models. Basic concepts. Recovery of the state trajectory (if we have time);

6) (Special guest) Transfer Learning и MapReduce (whatever this means).

**FAQ**

Do I need programming experience in Python or in other languages?

==== Come to the presentation of the course, we will discuss it. Or just come (B02, B19)

I have a question: «……?»

==== Come to the presentation of the course, we will discuss it. Or just come (B02, B19)