Discipline : **Information and Communication Technology**

Candidate's Profile:

The person eligible to apply for admission to the CUT Doctoral School in the scientific discipline of **information and communication technology** must be

➢ a graduate of a technical university Master's Degree study programme or a university Master's Degree study programme in one of the following: mathematics, physics or computer and information sciences;

➢ a graduate of the 1st cycle study programme who is a laureate of the "Pearls of Science" programme (in spite of not having completed the 2nd cycle study programme);

➢ a graduate of other Master's Degree study programmes on the condition that they have an impressive academic body of work in the discipline of information and communication technology.

Conditions of the entrance examination:

➢ The examination in the form of a test set comprised of 20 – 40 test questions – date of the examination according to the time schedule of the CUT DS recruitment process;

➢ Candidate interview (on *inter alia* the individual research plan) – only those persons will be admitted who have obtained no less than 50% of the total possible score in the examination – date of the interview according to the time schedule of the CUT DS recruitment process.

Problem areas for the entrance examination:

➢ Mathematics (elements of statistics, graph theory and linear algebra, fundamentals of differential and integral calculus)

➢ Programming paradigms (*inter alia*: procedural and object-oriented programming), design patterns

➢ Algorithms and data structures

➢ Artificial intelligence methods (*inter alia*: machine learning, neural networks and deep learning, data analysis)

➢ Optimisation methods (*inter alia*: genetic algorithms and other heuristics)

➢ Elements of cryptography and cybersecurity

➢ Computer networks

➢ Image analysis

➢ Fundamentals of databases

➢ Project management, methodologies of software development

➢ User-oriented programming