Tárgyleírás angol nyelvű képzés tárgya esetén

Tárgy neve: Application of discrete models

Tárgyfelelős neve: Burcsi Péter

Tárgyfelelős tudományos fokozata: PhD, habil.

Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja angolul / Aim of the subject:

Knowledge

- know the general and specific mathematical and computational principles, facts, rules, contexts and procedures that form the basis of computer science. The relevant fields are: analysis (calculus), numerical analysis, discrete mathematics, linear algebra, operations research, probability and statistics, foundations of logic, computation theory, the design and analysis of algorithms, formal languages and automata theory, and the foundations of artificial intelligence

Abilities:

- apply general and specific mathematical and computational principles, facts, rules and contexts in the field of information technology;
- apply formal models of computer science;

Attitude:

- strive for continuous professional development and general self-education;
- seek cooperation with professionals of other disciplines;

Autonomy, responsibility:

- strive for efficiency and high quality at work;
- take responsibility for sub-tasks in complex software development projects;

Az oktatás tartalma angolul / Major topics:

Introduction to Mathematical Software: interface, programming structures.

Mathematical program solving with software: functions for linear algebra and optimization, complex numbers, graphs, enumeration through examples.

Number theory with software: divisibility, greatest common divisor, Euclidean algorithm, fundamental theorem of arithmetic, applications, examples. Congruences and applications, Euler-Fermat theorem, Diophantine problems, Chinese remainder theorem. Applications and examples.

Polynomials: basic operations, division with remainder. Derivative and applications. Irreducibility. Lagrange interpolation and secret sharing.

Cryptographic and coding applications via example programs

A számonkérés és értékelés rendszere angolul / Requirements and evaluation:

Practice grade based on: quizzes, tests, assignments.

Irodalom / Literature:

Gregory V. Bard: SageMath for Undergraduates, American Mathematical Society, 2015
Biggs, N.L. (2002). Discrete mathematics. Oxford University Press (Second Edition).
Lehman, E.; Leighton, F.T.; Meyer, A.R. (2014). Mathematics for computer science.