

## Tárgytematika / Course Description

### Coding Theory

GKNM\_TATA019

**Tárgyfelelős neve /**

**Teacher's name:** dr. Nagy Szilvia

**Félév / Semester:** 2021/22/2

**Beszámolási forma /**

**Assesment:** Vizsga

**Tárgy heti óraszám /**

**Teaching hours(week):** 4/0/0

**Tárgy féléves óraszám /**

**Teaching hours(sem.):** 0/0/0

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### OKTATÁS CÉLJA / AIM OF THE COURSE

Summarizing the basics of compressing codings (source codes), the cryptography, and the error correcting coding methods (source codes)

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### TANTÁRGY TARTALMA / DESCRIPTION

Lossy and lossless compression methods, Shannon's source coding theorem, RLE, Huffman codes, arithmetic codes, Lempel-Ziv codes, practical applications, like image or sound coding.

Basic definitions of cryptography, basic cryptoprotocols.

Shannon's channel coding theorem, modelling channel, basics of inference with maximum likelihood. Channel coding method, Hamming codes, codes over finite fields, CRC, LDPC, RS codes, BCH codes. Code interleaving. Trellis codes Turbo codes.

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### SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

For signature, a presentation about codes. The exam is oral.

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### KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

David MacKay: Information theory, inference and learning algorithms.

