General Information:

Name of Course: # INFORMATION THEORY

Course Code: **IVM179ANMI**
Semester: 1st
Number of Credits: 4
Allotment of Hours per Week: 2 Lessons /Week
Evaluation: Term mark
Prerequisites:

Instructors: **Dr Zoltán SÁRI, associate professor**
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Introduction, Learning Outcomes:

The course gives an introduction into information theory, and its possible applications to communication systems. The topics covered include fundamentals of information theory, concept of entropy, lossy and lossless compression, basic model of communication, source coding and channel coding.

The objectives of this course:

Upon completion of this course the student should be able to: **interpret,** and **put into practice**

- the fundamental concepts of information theory,
- interpretation and measurement of information,
- model of communication, role of source- and channel coding,
- concepts and methods of lossless and lossy data compression,
- concept of communication over noisy channels.

Schedule:
The rough outline of the schedule is as follows:
Week 1-2: Fundamental concepts of information theory, interpretation and measurement of information
Week 3-4: Concept of entropy, conditional entropy, mutual information
Week 5-6: Basic model of communication, the role of source coding and channel coding.
Week 7: **Test 1**
Week 8: *Autumn Break*
Week 9: The source coding theorem.
Week 10: Shannon-Fano code, Lempel-Ziv code.
Week 11: Fundamentals of channel coding, properties of channels
Week 12-13: Error detection and error correction, error correcting codes, principles of decoding.
Week 14: Channel coding theorem
Week 15: **Test 2**

Attendance:
Attendance is required at all classes. Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lessons will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Evaluation and Grading
End of course grades assigned by instructor are based on:
Tests: 90%
Participation, progress, effort and attitude: 10%

Grading Scale:

Numeric Grade:	5	4	3	2	1
Evaluation in points:	89%-100%	77%-88%	66%-76%	55%-65%	0-54%

Students with Special Needs:
Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:

David J.C. MacKay: Information Theory, Inference, and Learning Algorithms, 2003, ISBN: 978-0-521-64298-9
Thomas M. Cover, Joy A. Thomas: Elements of Information Theory, Wiley, 2006, ISBN: 978-0-471-24195-9