

General Information:

Name of Course:	SIGNALS AND SYSTEMS
Course Code:	IVM181ANMI
Semester:	2nd
Number of Credits:	5
Allotment of Hours per Week:	4 Lessons /Week
Evaluation:	Signature (with grade)
Prerequisites:	Calculus, Linear Algebra

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

The course provides the theoretical background and tools of signal processing and systems analysis. The main objective of the course is to equip the students with the tools and techniques required for the analysis of systems commonly found in control, signal processing and communication, and to provide an introduction into the implementation possibilities and practical applications of these techniques.

The objectives of this course:

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

- techniques of signal processing, systems representation and analysis,
- mathematical representation and handling of systems,
- analysis of systems in time-, frequency-, and complex frequency-domain,
- filtering and its applications in signal processing.

Schedule:

The rough outline of the schedule is as follows:

Week 1-2: Mathematical representation of signals, Properties of signals
Week 3-4: Characterization and mathematical representation of systems, Properties of systems
Week 5: Interpretation and applications of Convolution sum and Convolution integral
Week 6: State-space representation of systems, Analysis, Applications
Week 7-8: The Fourier-transform, spectral analysis of signals and systems
Week 9: **Test 1**
Week 10: *Spring brake*
Week 11: Sampling and reconstruction, sampling theorem in time and frequency domain
Week 12: DFT, FFT, Applications
Week 13: The Laplace-transform, system analysis in the complex frequency domain
Week 14: The z-transform and its applications, Filtering, FIR and IIR architectures, Applications
Week 14: Introduction to nonlinear systems
Week 15: **Test 2**

Attendance:

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson 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 + 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:

A. V. Oppenheim, A. S. Willsky: **Signals and systems**, Prentice-Hall, 1982

S. Haykin, B. Van Veen: **Signals and Systems**, John Wiley and Sons, 1999

S. T. Karris: **Signals and Systems with MATLAB Computing and Simulink Modeling** (Fourth Edition), Orchard Publications, 2008