Course name:	**Discrete Signals and Systems**
Abbreviation / number:	DSS / 5914 Version: 21.06.2019
Degree programs:	Elektrotechnik (M. Sc.), Information Technology (M. Sc.)
Semester:	Elektrotechnik (M. Sc.): first semester Information Technology (M. Sc.): full-time study: first semester; part-time study: first or third semester
Frequency of the offer:	Winter term
Responsible lecturer:	Prof. Dr.-Ing. Uwe Meier
Lecturers:	Prof. Dr.-Ing. Uwe Meier
Language:	English
Relation to curriculum:	Compulsory subject
Teaching type / hours:	Lecture / 3 hours per week, Exercise / 1 hour per week
Students' workload:	150 hours = 60 hours confrontation time (lectures, exercises) plus 90 hours additional student individual work / homework time
ECTS credits:	5
Prerequisites:	Content requirements: Continuous signals and linear systems: complex notation, FOURIER series and transformation
Goals:	The course provides basic knowledge of how discrete signals and discrete linear time-invariant systems are characterized and analyzed. Upon completion of the course students are able to - describe sampling and reconstruction of signals, - use appropriate transform methods, - understand filtering with window functions, - design frequency-selective filters, - use simulation software for signal processing. After completion of the course, students are able to critically analyze signal processing problems and create appropriate solutions.
Contents:	Repetition of time-continuous signals (energy and power signals, deterministic and random signals, cross- and auto-correlation, low-pass and band-pass signals, FOURIER and HILBERT transform, filtering with window functions, frequency-selective filters). Time-discrete signals (sampling theorem, discrete and fast FOURIER transform) Time-discrete systems (z-transform, filtering with window functions, frequency-selective filters)
Examination:	Written examination
Teaching media:	Projector / charts, blackboard, simulation software
Literature:	Script with exercise problems for downloading. Hayes, M. H.: Schaum's Outlines. Digital Signal Processing. McGraw Hill. Oppenheim, A. V, Willsky, A. S.: Signals and Systems. Prentice Hall. Oppenheim, A. V., Schafer, R. W.: Discrete-Time Signal Processing. Prentice Hall.