TH Aschaffenburg
university of applied sciences

Digital Signal Processing with MATLAB and Python

Course number	1201
Hours per week:	2
ECTS:	3
Scheduled:	Winter Term
Format	Lecture and Lab
Examination:	Oral exam (15 min.)
Lecturer:	Prof. Dr.-Ing. Hinrich Mewes
Objectives:	**Knowledge:** The students know various algorithms of digital signal processing and their applications. They can specify examples of application fields. **Skills:** The Students can implement digital signal processing techniques in MATLAB and Python. They are able to interpret the results of their calculations and simulations. **Competences:** Students can apply digital signal processing techniques to practical tasks and develop solutions. They are able to apply digital filters to real world signals, improve signals and analyze signals using spectral estimation techniques.
Contents:	• Discrete time signals und systems • Sampling theorem • MATLAB and Python for signal processing • Digital filters: analysis, description, design • Discrete Fourier transform and spectral estimation • Projects: Filtering and spectral estimation of real world signals
Pre-requisites	Engineering Mathematics I & II, Computer Science I & II
Recommended Reading:	Mark Wickert: Signals and Systems for Dummies, John Wiley and Sons James Mc Clellan, Ronald W. Schafer, Marl A. Yoder: DSP First Pearson Education Monson H. Hayes: Digital Signal Processing, McGraw Hill All books in the current edition