Typical syllabus of Digital Signal Processing Chapter numbers relate to the 3rd edition of Proakis, Manolakis, *Digital Signal Processing* Digital Communications parts marked in red.	
1	Contents, overview over linear transforms, sampling theorem, linear quantization, networks with delay elements (own material)
2	Discrete-time systems, impulse response, convolution, stability, (Chapter 2, pp. 43-91)
3	Differential equation rehearsal, difference equation, remarks on poles in the continuous case (partly in Chapter 2, pp. 91-110)
4	Structures of LTI systems (Section 2.5.1), quick reminder of correlation sequences (Section 2.6.1), beginning of the z-transform (Chapter 3)
5	Z-transform ctd. (Chapter 3) and some exercises with the z-transform
6	Z-transform properties repeated
7	More exercises on the Z-transform
8	One-sided Z transform (Section 3.5) and solution of difference equations (Section 3.5.2), analysis of linear time-invariant systems in the Z-domain (Sections 3.6 – 3.6.5)
9	Examples of filter characteristics (Sections 4.5.1 – 4.5.6)
10	Digital sinusoidal oscillator (Section 4.5.7), inverse systems and deconvolution (Section 4.6), minimum-phase, maximum-phase, … (Section 4.6.2), system identification and deconvolution (Section 4.6.3)
11	Introduction to Communications (baseband transmission up to matched filter)
12	(Sections 4.2.1; 5.1.1, 5.1.2), DFT picture of time/DFT domain and relations between essential parameters, scaling in time and frequency, where are “negative” frequencies in the DFT frame
13	Matched filter up to whitened matched filter; transmitter/receiver chain
14	(Section 5.1.3); Relationship of the DFT to other transforms (Section 5.1.4); Diagonalization of a Toeplitz matrix; Application OFDM/ DMT
15	Leftover from relationship and Section 4.2, frequency analysis of discrete time signals until Section 4.2.5 (includes power and energy density spectra and Gibb’s phenomenon), Communications: replacing the discrete-time transmission link by F(z) and introducing zero-forcing
16	FFT (Cooley-Tukey), Overlap-Save, Overlap-Add methods, Linear Prediction
17	Linear Prediction contd., Implementation of Discrete-Time Systems, i.e., Structures of FIR systems, Section 7.2. ending with Lattice structures (mentioning the relations between lattice filters and Levinson-Durbin alg. for linear prediction)
18	Zero forcing and MMSE equalizers, LMS and iterative ZF
19	Structures for FIR systems (Sections 7.2-7.2.4, pp.502-519)
20	Decision-Feedback Eq., Tomlinson precoding, MMSE
21	Structures of IIR systems (Section 7.3) (direct form, cascade, parallel, lattice-ladder) up to state-space analysis (Section 7.4.1, pp. 519-543), limit cycle mentioned (Section 7.7.1)
22	Design of digital FIR filters including window functions, (Sections 8.1-8.24, pp. 619-652) (homework: read “power spectrum estimation” in Chapter 12, pp. 896-909 (919) as preparation for last part of home assignment)
23	Design of IIR filters from analog filters (Sections 8.3-8.3.6), especially bilinear transform and filter types (Butterworth, Bessel, Tschebychev, Elliptical) Leftovers from communications topics: especially bandpass transmission and corresponding equalization
24	Multirate, quadrature-mirror filter, filterbanks (links to multicarrier modulation), video coding, (wavelets if time permits)