ECE 580
NETWORK THEORY
Fall 2018

LECTURES: **MW 10:00-11:50 am**
Room: ALS 4001

INSTRUCTOR: **Gabor C. Temes, Professor**
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OFFICE HOUR: **MW 14:00-15:00 pm**

CLASS WEBSITE http://classes.engr.oregonstate.edu/eecs/fall2018/ece580/

PREREQUISITE: Graduate standing in ECE

TEXT: Lecture notes will be posted on the Web. Parts of the following books will be used:

· Electrical Network Theory, N. Balabanian and T. Bickart, Krieger Publishing Co., 1983: Chapters 1-3 & 8.

· Introduction to Circuit Synthesis and Design, G. Temes and J. LaPatra, McGraw-Hill, 1977: Chapters 7-9   & 12.

· Electrical Networks, J. Choma, Krieger Publishing Co., 1991: Chapters III & IX.

(Note: It is not necessary to acquire these books. Most are out of print. Lecture notes will be posted on the class website.)

MATERIAL TO BE COVERED (if time permits):

· *Network classification*: linear/nonlinear, time-varying/invariant, active/passive, lossy/lossless, reciprocal/nonreciprocal, lumped/distributed, dynamic/memoryless, sampled-data/continuous-time networks.
Definitions useful in all discussions involving circuits.

Networks components: R, L, C elements; ideal/perfect/real transformers; op-amps; gyrators; independent/dependent sources.
Definitions useful in all discussions involving circuits.

Network analysis: the incidence matrix; branch relations; nodal analysis; two-port parameters; multiport networks; multiport parameters; scattering relations and parameters; transfer functions; sensitivity analysis.
The basis of computer-aided and paper-and-pencil circuit analysis.

· *Network synthesis*: approximation theory for continuous-time and sampled-data filters; the design of passive, active R-C, Gm-C and switched-capacitor filters.
The basics of active, passive and sampled-data analog filters.

MIDTERM EXAMINATION: Friday, October 26, 2018, 10 – 11:10 am
FINAL EXAMINATION: Wednesday, Dec. 5, 2 – 3:50 pm.