ECE 580
NETWORK THEORY
Fall 2022

LECTURES: MW 10:00-11:50 am, in KEC 1003.
https://oregonstate.zoom.us/j/95995128945?pwd=dUx5T2JpL2pScTlPUlp6WXRaaf04zQT09

Gabor C. Temes, Professor

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OFFICE HOUR: MW 14:00-15:00 pm

PREREQUISITE: Graduate standing in ECE

Website: https://classes.engr.oregonstate.edu/eecs/fall2022/ece580

TA: Manxin Li <liman@oregonstate.edu>

TA Office Hours: TF 13:30-14:30 pm, in class zoom room

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


(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 of passive, active R-C, Gm-C and switched-capacitor filters.
- **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: Wednesday, Oct. 19, 10:00 - 11:50 am.

FINAL EXAMINATION: Wednesday, Dec. 7, 14:00 - 16:00 pm.