Santa Clara University
Department of Electrical Engineering
Aleksandar I. Zecevic
Winter 2018

ELEN 112:   Modern Network Synthesis and Design
TEXT: Gobind Daryanani, *Principles of Active Network Synthesis and Design*, Wiley, 1976

SYLLABUS

WEEK		TOPICS	CHAPTER
1	01/08	Review of network analysis Network functions and Bode plots	1, 2
2	01/15	Basic filter concepts The approximation problem	3, 4
3	01/22	The approximation problem (ctd.)	4
4	01/29	Basic active filter synthesis **MIDTERM 1**	7
5	02/05	Basic active filter synthesis (ctd.) Probability and random variables	7 Appendix C
6	02/12	Sensitivity analysis	5
7	02/19	Positive feedback biquads **MIDTERM 2**	8
8	02/26	Positive feedback biquads (ctd.) Negative feedback biquads	8, 9
9	03/05	Negative feedback biquads (ctd.) Switched capacitor filters	9
10	03/12	Passive network synthesis	6

LEARNING OUTCOMES

Students who successfully complete this course should be able to:

1. Formulate node voltage equations for op-amp circuits in the *s*-domain.
2. Apply Butterworth, Chebyshev and elliptic approximation techniques.
3. Determine a transfer function that satisfies given filter specifications.
4. Utilize positive and negative feedback biquads to realize a given transfer function.
5. Perform a basic sensitivity analysis of a filter.
6. Design and test filters that meet a given set of specifications.

GENERAL INFORMATION

OFFICE:	Engineering Center, Room 223
OFFICE HOURS:	Tuesdays and Thursdays 4:00 – 5:00, and by appointment.
PHONE:	(408) 554-2394
E-MAIL:	azecevic@scu.edu
WEBSITE:	http://www.engr.scu.edu/~azecevic/

GRADING

Homework 10%
Midterms 15% each
Design Project I 10%
Design Project II 20%
Final 30%

DESIGN PROJECTS

Both projects involve simulation in Matlab and SPICE, and the performance of the designed circuits will be evaluated in the laboratory. Project 1 will be assigned in week 5, and should be completed in week 7. Project 2 will be assigned in week 7, and should be completed in week 10.

Academic Integrity Pledge:

"I am committed to being a person of integrity. I pledge, as a member of the Santa Clara University community, to abide by and uphold the standards of academic integrity contained in the Student Conduct Code."

Disabilities Resources:

To request academic accommodations for a disability, students must be registered with Disabilities Resources, located in Benson, room 216. In order to register, please go on-line to www.scu.edu/disabilities. You will need to register and provide professional documentation of a disability prior to receiving academic accommodations. It is best to read "Required Documentation" on the website before starting the registration process in order to determine what is needed. You may contact Disabilities Resources at 408-554-4109 if you have questions.

To be in compliance with Title IX and the ADA/Section 504, a school must offer appropriate accommodation to a student whose absence is related to pregnancy or childbirth. If you are in need of an accommodation, contact the professor at the beginning of the course so that arrangement can be made. The student must also contact Disability Resources (DR) at (408) 554-4109 or www.scu.edu/disabilities to register for accommodations.

Santa Clara University upholds a zero tolerance policy for discrimination, harassment and sexual misconduct. If you (or someone you know) has experienced discrimination or harassment including sexual assault, domestic and dating violence or stalking, we encourage you to tell someone what happened promptly. For more information, please go to www.scu.edu/studentlife or contact the university's EEO and Title IX Coordinator, Belinda Guthrie at 408-554-4113 or by email at bguthrie@scu.edu. Look at: http://www.scu.edu/affirmativeaction/compliancelinks.cfm.