

ENSC320 – Electric Circuits II
AQ 3003
Lec: M, W, F (15:30 – 16:20)

Instructor: Ash M Parameswaran
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Course Description:

This course deals with circuit analysis using mathematical tools. The topics covered are as follows: Laplace transform and its application to circuit analysis. Concept of poles and zeros, frequency response of circuits. Resonant and bandpass responses of electrical circuits and filters. A brief study of poly phase circuits and two port networks will also be conducted.

Prerequisites

ENSC 220 and MATH310 are mandatory prerequisites for this course. It is expected that you are comfortable with analyzing 1st and 2nd circuits, solving differential equations and that you have been exposed to the Laplace transform. You will also be expected to be familiar with software tools such as MATLAB and PSPICE, which will be needed on the course assignments and labs.

ENSC 380 is a co-requisite for this course since each course will cover some material that is needed by the other.

Mailing List

The course will have a mailing list "ensc320-d1".

Tentative Course Schedule

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| Wk 1 | A quick review of circuit analysis from ENSC220 concepts of AC, AC power and Phasor |
| Wk 2 - 3 | Introduction of Laplace Transform (selective review from MATH310 topics)
Step/impulse function, functional/operational transform, concepts of poles and zeros. |
| Wk 4 - 5 | Application of LT in circuit analysis
S Domain analysis, Transfer functions, convolution integral, sinusoidal steady state response and impulse function in circuit analysis. |
| Wk 6 – 7 | Frequency selective Circuits
Filters, low-pass, high-pass, band-pass and band-reject filters, |

bode diagrams, poles and zeros in bode diagrams.

Wk 8 – 9	Active filters Simple first order filters, OPAMP based filters, higher order filters.
Wk 10 - 11	Polyphase circuits
Wk 12	Two port networks
Wk 13	Review

Text:

J.W. Nilsson and S.A. Riedel, Electric Circuits, 6th ed., Printice Hall, 2000

Other references:

R.A. DeCarlo and P. M. Lin
Linear Circuit Analysis: A Time Domain and Phasor Approach, Prentice Hall, 1995.

Schaum's Theory and Problems of Basic Circuit Analysis, by J. O'Malley, 2nd ed.,
McGraw Hill.

Schaum's Theory and problems of Electric Circuit, by J. A. Edminister, 2nd ed.,
McGraw Hill.

Laboratory

There will be two (or possibly three) lab experiments for this course. You are expected to form groups of two (or three). The exact lab-experiment will be announced later and the details will be posted in the course web site.

Grading:

Home Work:	10%
Lab	20%
Midterm	25%
Final	45%

All remaining details will be posted in the web site:

<http://www.ensc.sfu.ca/people/faculty/parameswaran/personal/320>