ELEC4506
Computer-Aided Circuit Design

Schedule:

Lectures: Monday and Wednesday 4:00-5:30pm ***(starting September 9)***
Labs: (Every 2 weeks *starting week of September 20)*
ELEC4506 A1E: Tuesday 8:30am-11:30am
ELEC4506 A2E: Monday 11:30am-2:30pm

Classroom:

For the virtual classroom and Labs, we will be using **BigBlueButton** within CuLearn.

(BigBlueButton is a web conferencing tool that facilitates online and real-time teaching and communication)

For more info on BBB, please check the following site:

https://carleton.ca/culearnsupport/students/bigbluebutton/

Course Outline

Frequency-Domain:

- *Modified-Nodal Analysis*
- *LU decomposition*
- *Sparse techniques*
- *Sensitivity Analysis*

Instructor:
Prof. Michel Nakhla
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http://www.doe.carleton.ca/~msn/

Linear Time-Domain:

- *Multi-step methods*
- *Numerical stability*
- *Time-domain Sensitivity Analysis*

DC Solution of Nonlinear Circuits

- *Jacobian matrix,*
- *Newton's iterations*
- *Convergence and accuracy issues*

Nonlinear Time-Domain

- *Charge-based formulation of the circuit equations*
- *Iterative time-stepping solution*

REFERENCES

(1) Computer Methods for Circuit Analysis & Design
J. Vlach and K. Singhal, Van Nostrand Reinhold 1983/ 1994
(2) Circuit Simulation
F. Najm, Wiley, 2010.

+Handouts

Additional Reading Material

(1) Electronic Circuit and Simulation Methods
L. Pillage, R. Rohrer, C. Visweswariah, McGraw-Hill 1995
(2) Introduction to MATLAB for Engineers and Scientists (or equivalent)
Delores M. Etter, Prentice Hall 1996

Course Grading

55% Final Exam *(open book)*
25% Midterm Exams *(open book)*
20% Labs

Passing the final exam is necessary condition for passing the course

Equity Services Accommodation:
http://www.carleton.ca/equity/accommodation/outlines.htm