The course covers the basic principles and algorithms of circuit simulation and is intended for developers/users of CAD tools and circuit/system designers. The application of the simulation algorithms spans a wide spectrum of engineering fields.

Course Outline

Frequency-Domain:
- Modified-Nodal Analysis
- LU decomposition
- Sparse techniques
- Sensitivity Analysis

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

Sensitivity Analysis

REFERENCES

(1) Computer Methods for Circuit Analysis & Design

(2) Circuit Simulation

+Handouts

Additional Reading Material

(1) Electronic Circuit and Simulation Methods

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

Teaching Assistants:
Germin Ghaly: germinghaly@cmail.carleton.ca
Mohsen Asgarimoghaddam:
mohsenasgarimoghadd@cmail.carleton
Course Grading

50% Final Exam *(open book-eProctoring)*
25% Midterm Exams *(open book-eProctoring)*
25% Labs and Assignments

*Passing the final exam is necessary condition for passing the course*

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