Core Lab I and Computational Techniques

Upon completion of Core Lab I and Computational Techniques, students will be able to:

Core Lab I (Electronics):
1. Analyze the characteristics of passive filters and design symmetric T- and Π- filters using inductances and capacitances.
2. Design various types of active filters such as LPF, BPF, HPF, and Notch filters utilizing OPAMP IC – 741C.
3. Create oscillators including an astable multivibrator with BJT for square wave generation and VCO, and a relaxation oscillator using UJT (2N 2646).
4. Develop A/D and D/A converters using discrete components for signal conversion.
5. Investigate the drain and transfer characteristics of MOSFET in both Depletion and Enhancement modes.
6. Program a micro-processor (8085) and interface it with a 7-segment display for pulse counting.
7. Program a micro-controller (80851) for specific applications.

Computational Techniques (Lab):
1. Apply matrix computing in ELN Matlab/Scilab/Octave and differentiate between Matrix and Array operations.
2. Utilize storage, constants (e, pi, Inf, NaN, etc.), and test matrices (Hadamard, Pascal, Magic, etc.) for various computational tasks.
3. Implement Data Visualization techniques including 2D/3D/Interactive plotting, Curve fitting, Interpolation, and root finding using appropriate tools and algorithms.
4. Create scientific reports using the LaTeX ecosystem, understanding document structure, commands, and environments for Typesetting Mathematics, graphics inclusion, and generating bibliographies.

Students will demonstrate understanding and application of these concepts through hands-on experiments, analysis, and reporting, fostering critical thinking, problem-solving, and technical skills development.

Select Language

Powered by Google Translate