

**2EC08: SIMULATION AND DESIGN TOOLS
CREDITS - 1 (LTP:0,0,1)**

Course Objective:

Introduce Simulation and Designing tools / software to design and simulate various analog and digital circuits, and design PCB layout for the desired circuits using PCB design tools.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE	CE	ESE	CE	100	
0	0	2	1	00	00	40		60

Course Contents:

Unit No.	Topics	Teaching Hours
1	Introduction to PSpice Software : Introduction to PSpice software, General purpose circuit simulation using Schematic Editor, Introduction to net list command based SPICE simulation, basic net list commands. Basic circuit analyses: DC, AC Transient. Schematic design simulation using PROTEUS/OrCAD tool.	14
2	Introduction to PCB Design Software : Introduction to PCB Design software, Schematic Entry, Net list Creation, Working with component libraries, Design of Boards, Layout of Parts, Optimizing Parts Placements, Pads and Via, Manual and Auto Routing, Handling Multiple Layers. Layout verification of test circuits using EAGLE/OrCAD tool.	08
3	Introduction to MATLAB : Introduction to MATLAB, use MATLAB functions. Writing simple programs using MATLAB, handling arrays, files, plotting of functions etc. Writing m files for Creation of analog & discrete signals, plotting of signals etc. Simulation of electronic circuits using MATLAB.	08
Total		30

List of References:

- Rashid H. Muhammad, *“Introduction to Pspice Using Orcad for Circuits and Electronics”*, 3rd edition, PHI, 2010.
- Simon Monk, *“Make Your Own PCB’s With EAGLE”*, 2nd edition Mcgraw Hill ,2014
- Brian R. Hunt, Ronald L. Lipsman, Jonathan M. Rosenberg, Kevin R. Coombes, John E. Osborn, Garrett J. Stuck. *“A guide to MATLAB: For beginners and experienced users”* 2nd edition Cambridge University Press, 2006

Course Outcomes (Cos):

At the end of this course students will be able to...

- Design simple electronics circuits using software tools like PROTEUS/OrCAD.
- Analyze simple analog and digital circuits using simulation software like PROTEUS/OrCAD.
- Design PCB Layout for given circuit using PCB Software like EAGLE, OrCAD.

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4. Analyze various MATLAB command.
5. Generate various waveforms using MATLAB.
6. Analyze basic electronic system blocks using MATLAB