

Category	Website Name	URL	Description	Access	Academic Stage
Teaching References	Khan Academy — Electrical Engineering	https://www.khanacademy.org/science/electrical-engineering	Free video lessons on circuit analysis, Kirchhoff's laws, AC/DC circuits, and electronics fundamentals. Ideal for 1st and 2nd year students	Free	All Stages
	MIT OpenCourseWare — Communications	https://ocw.mit.edu/courses/6-450-principles-of-digital-communications-i-fall-2006/	Full MIT digital communications course materials: lectures, exams, and solutions. A trusted academic resource for 3rd and 4th year students	Free	All Stages
	Electrical4U	https://www.electrical4u.com	Comprehensive site covering electronics, digital systems, communications, and DSP with simplified explanations and practical examples	Free	All Stages
	All About Circuits	https://www.allaboutcircuits.com	Complete engineering reference: text and video tutorials on circuit analysis, digital electronics, and embedded system design	Free	All Stages
	DSP Guide — Digital Signal Processing Book	https://www.dspguide.com	A complete free e-book on digital signal processing: FFT, filters, and sampling theory. An essential reference for DSP courses	Free	All Stages
	NPTEL — IIT Video Lectures	https://nptel.ac.in/course.html	Free video courses from India's top engineering universities: signal processing, digital communications, embedded systems. High academic quality	Free	All Stages
	Electronics Tutorials	https://www.electronics-tutorials.ws	Detailed tutorials on electronics: transistors, amplifiers, filters, digital logic — with clear circuit diagrams and illustrations	Free	All Stages
Free Tools & Software	GNU Octave (Free MATLAB Alternative)	https://octave.org	Free, open-source computing environment compatible with MATLAB. Perfect for students who don't have a MATLAB license	Free	All Stages
	Python — SciPy & NumPy	https://scipy.org	Free scientific Python libraries: signal processing, FFT, filter design, and plotting. A powerful open-source alternative to MATLAB	Free	All Stages
	Falstad Circuit Simulator	https://www.falstad.com/circuit	Free browser-based circuit simulator that visualizes current flow in real time. No installation required	Free	All Stages

	CircuitLab — Circuit Simulation	https://www.circuitlab.com	Browser-based circuit drawing and simulation tool. Supports time-domain and frequency-domain analysis	Free	All Stages
	Google Colab — Free Python Environment	https://colab.research.google.com	Free Python environment from Google running in the browser. Suitable for signal processing experiments and AI projects	Free	All Stages
	Wolfram Alpha	https://www.wolframalpha.com	Computational engine that instantly solves equations, integrals, Laplace and Fourier transforms. Indispensable for solving homework problems	Free	All Stages
	Desmos — Interactive Graphing	https://www.desmos.com	Interactive function and signal plotter in the browser. Useful for understanding time-domain and frequency-domain signal behavior	Free	All Stages
	Tinkercad — Arduino Simulation	https://www.tinkercad.com/circuits	Free Autodesk platform for simulating Arduino and AVR circuits in the browser. Ideal for practical projects and embedded systems	Free	All Stages
Practice & Problem Solving	Project Rhea — DSP Practice Problems	https://www.projectrhea.org/rhea/index.php/Digital_signal_processing_practice_problems_list	Comprehensive list of digital signal processing problems with detailed solutions. An excellent resource for exam review	Free	All Stages
	ExamVeda — ECE MCQ Questions	https://www.examveda.com/electronics-and-communications-engineering/	Thousands of multiple-choice questions in communications and electronics with answers. Useful for self-assessment and exam preparation	Free	All Stages
	Docsity — Past Exams & Exercises	https://www.docsity.com/en/exercises/engineering/digital-signal-processing/	Past exams and exercises from international universities in DSP and communications. Useful for benchmarking difficulty levels	Free	All Stages
	Brilliant.org — Math & Engineering	https://brilliant.org	Interactive platform for learning mathematics, physics, and engineering through problem solving. Covers linear algebra, probability, and signal theory	Partially Free	All Stages
	GeeksforGeeks — Digital Electronics	https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/	Tutorials and exercises in digital electronics: logic gates, Karnaugh maps, and algorithms — with interactive quizzes	Free	All Stages
	Chegg Study (limited free)	https://www.chegg.com	Step-by-step solutions to engineering textbook problems. Useful for verifying answers and understanding solution methodology	Partially Paid	All Stages

	Stack Exchange — Signal Processing	https://dsp.stackexchange.com	Academic Q&A forum where students can ask questions and receive answers from signal processing and communications specialists worldwide	Free	All Stages
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