

S.No.	LAB CODE	Lab Practical	Virtual Lab Link	Alternate Lab Link
1	KEC451	To study DSB/ SSB amplitude modulation & determine its modulation factor & power in side bands.		<a href="http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=260&amp;cnt=1">http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=260&amp;cnt=1</a>
2	KEC451	To study amplitude demodulation by linear diode detector.		<a href="http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=259&amp;cnt=359">http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=259&amp;cnt=359</a>
3	KEC451	To study frequency modulation and determine its modulation factor.		<a href="http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=261&amp;cnt=474">http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=261&amp;cnt=474</a>
4	KEC451	To study sampling and reconstruction of pulse amplitude modulation system.		
5	KEC451	To study pulse amplitude modulation. a) Using switching method. b) By sample and hold circuit.		
6	KEC451	To demodulate the obtained PAM signal by 2nd order LPF.		
7	KEC451	To study pulse width modulation and pulse position modulation.		
8	KEC451	To study pulse code modulation and demodulation technique.		
9	KEC451	To study delta modulation and demodulation technique.		
10	KEC451	To construct a square wave with the help of fundamental frequency and its harmonic component.		
11	KEC451	Study of amplitude shift keying modulator and demodulator.		
12	KEC451	Study of frequency shift keying modulator and demodulator.		
13	KEC451	Study of phase shift keying modulator and demodulator.		<a href="http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=263&amp;cnt=2407">http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=263&amp;cnt=2407</a>
14	KEC451	Study of single bit error detection and correction using hamming code.		
15	KEC451	Study of quadrature phase shift keying modulator and demodulator.		<a href="http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=1065&amp;cnt=2404">http://vlab.amrita.edu/index.php?sub=59&amp;brch=163&amp;sim=1065&amp;cnt=2404</a>
16	KEC451	To simulate differential phase shift keying technique using MATLAB software.		

17	KEC451	To simulate M-ary Phase shift keying technique using MATLAB software (8PSK, 16PSK) and perform BER calculations		
18	KEC451	Design a front end BPSK modulator and demodulator.		
19	KEC452	Characteristic of BJT: Study of BJT in various configurations (such as CE/CS, CB/CG,CC/CD)	<a href="http://vlabs.iitkgp.ernet.in/be/exp11/index.html">http://vlabs.iitkgp.ernet.in/be/exp11/index.html</a>	
20	KEC452	BJT in CE configuration: Graphical measurement of h-parameters from input and output characteristics, measurement of Av, Ai, Ro and Ri of CE amplifier with potential divider biasing	<a href="http://vlabs.iitkgp.ernet.in/be/exp13/index.html">http://vlabs.iitkgp.ernet.in/be/exp13/index.html</a>	
21	KEC452	Study of Multi-stage amplifiers: Frequency response of single stage and multistage amplifiers		
22	KEC452	Feedback topologies: Study of voltage series, current series, voltage shunt, current shunt, effect of feedback on gain, bandwidth etc		
23	KEC452	Measurement of Op-Amp parameters: Common mode gain, differential mode gain, CMRR, slew rate	<a href="http://vlabs.iitkgp.ernet.in/be/exp17/index.html">http://vlabs.iitkgp.ernet.in/be/exp17/index.html</a>	
24	KEC452	Applications of Op-Amp: Op-Amp as summing amplifier, difference amplifier, integrator and differentiator	<a href="http://vlabs.iitkgp.ernet.in/be/exp18/index.html">http://vlabs.iitkgp.ernet.in/be/exp18/index.html</a>	
25	KEC452	Field effect transistors: Single stage common source FET amplifier –plot of gain in dB vs frequency, measurement of bandwidth, input impedance, maximum signal handling capacity (MSHC) of an amplifier.	<a href="https://www.iitg.ac.in/cseweb/vlab/vlsi/MOSFET_simulator.html">https://www.iitg.ac.in/cseweb/vlab/vlsi/MOSFET_simulator.html</a>	
26	KEC452	Oscillators: Study of sinusoidal oscillators- RC oscillators (phase shift, Wien bridge etc.).	<a href="http://vlabs.iitkgp.ernet.in/be/exp14/index.html">http://vlabs.iitkgp.ernet.in/be/exp14/index.html</a>	
27	KEC452	Study of LC oscillators (Hartley, Colpitt, Clapp etc.),	<a href="https://vlab.amrita.edu/?sub=1&amp;brch=201&amp;sim=1137&amp;cnt=1">https://vlab.amrita.edu/?sub=1&amp;brch=201&amp;sim=1137&amp;cnt=1</a>	

28	KEC452	Study of non-sinusoidal oscillators	<a href="http://he-coep.vlabs.ac.in/Experiment8/Aim.html?domain=ElectronicsandCommunications&amp;lab=Hybrid%20Electronics%20Lab">http://he-coep.vlabs.ac.in/Experiment8/Aim.html?domain=ElectronicsandCommunications&amp;lab=Hybrid%20Electronics%20Lab</a>	
29	KEC452	Simulation of amplifier circuits studied in the lab using any available simulation software and measurement of bandwidth and other parameters with the help of simulation software		
30	KEC452	ADC/DAC: Design and study of Analog to Digital Converter	<a href="http://he-coep.vlabs.ac.in/Experiment6/Aim.html?domain=ElectronicsandCommunications&amp;lab=Hybrid%20Electronics%20Lab">http://he-coep.vlabs.ac.in/Experiment6/Aim.html?domain=ElectronicsandCommunications&amp;lab=Hybrid%20Electronics%20Lab</a>	
31	KEC452	Design and study of Digital to Analog Converter	<a href="http://he-coep.vlabs.ac.in/Experiment6/Aim.html?domain=ElectronicsandCommunications&amp;lab=Hybrid%20Electronics%20Lab">http://he-coep.vlabs.ac.in/Experiment6/Aim.html?domain=ElectronicsandCommunications&amp;lab=Hybrid%20Electronics%20Lab</a>	
32	KEC452	Add-on	<a href="http://vlabs.iitb.ac.in/vlabs-dev/labs/analog-electronics/labs/log-antilog-amplifier-iitr/index.html">http://vlabs.iitb.ac.in/vlabs-dev/labs/analog-electronics/labs/log-antilog-amplifier-iitr/index.html</a>	
33	KEC452	Add-on	<a href="https://www.iitg.ac.in/cseweb/vlab/vlsi/CMOS_theory.html">https://www.iitg.ac.in/cseweb/vlab/vlsi/CMOS_theory.html</a>	
34	KEC453	Introduction to MATLAB a. To define and use variables and functions in MATLAB. b. To define and use Vectors and Matrices in MATLAB. c. To study various MATLAB arithmetic operators and mathematical functions. d. To create and use m-files.		

35	KEC453	<p>Basic plotting of signals</p> <p>a. To study various MATLAB commands for creating two and three dimensional plots.</p> <p>b. Write a MATLAB program to plot the following continuous time and discrete time signals.</p> <p>i. Step Function</p> <p>ii. Impulse Function</p> <p>iii. Exponential Function</p> <p>iv. Ramp Function</p> <p>v. Sine Function</p>	<a href="http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties(objectives).html">http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties(objectives).html</a>	
36	KEC453	<p>Time and Amplitude transformations</p> <p>Write a MATLAB program to perform amplitude-scaling, time-scaling and timeshifting on a given signal.</p>	<a href="http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties(objectives).html">http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties(objectives).html</a>	
37	KEC453	<p>Convolution of given signals</p> <p>Write a MATLAB program to obtain linear convolution of the given sequences.</p>	<a href="http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties%205(objectives).html">http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties%205(objectives).html</a>	
38	KEC453	<p>Autocorrelation and Cross-correlation</p> <p>a. Write a MATLAB program to compute autocorrelation of a sequence <math>x(n)</math> and verify the property.</p> <p>b. Write a MATLAB program to compute cross-correlation of sequences <math>x(n)</math> and <math>y(n)</math> and verify the property.</p>	<a href="http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties%205(objectives).html">http://ssl-iitg.vlabs.ac.in/Signals%20and%20their%20properties%205(objectives).html</a>	
39	KEC453	<p>Fourier Series and Gibbs Phenomenon</p> <p>a. To calculate Fourier series coefficients associated with Square Wave.</p> <p>b. To Sum the first 10 terms and plot the Fourier series as a function of time.</p> <p>c. To Sum the first 50 terms and plot the Fourier series as a function of time.</p>	<a href="http://ssl-iitg.vlabs.ac.in/Signals_exp3(objectives).html">http://ssl-iitg.vlabs.ac.in/Signals_exp3(objectives).html</a>	
40	KEC453	<p>Calculating transforms using MATLAB</p> <p>a. Calculate and plot Fourier transform of a given signal.</p> <p>b. Calculate and plot Z-transform of a given signal.</p>		

41	KEC453	Impulse response and Step response of a given system a. Write a MATLAB program to find the impulse response and step response of a system from its difference equation. b. Compute and plot the response of a given system to a given input.		
42	KEC453	Pole-zero diagram and bode diagram a. Write a MATLAB program to find pole-zero diagram, bode diagram of a given system from the given system function. b. Write a MATLAB program to find, bode diagram of a given system from the given system function.		
43	KEC453	Frequency response of a system Write a MATLAB program to plot magnitude and phase response of a given system.		
44	KEC453	Checking linearity/non-linearity of a system using SIMULINK a. Build a system that amplifies a sine wave by a factor of two. b. Test the linearity of this system using SIMULINK.		
45	REC651	To study microwave test bench.		
46	REC651	To study the characteristics of reflex klystron tube and to determine its electronic tuning range.		
47	REC651	To determine the frequency and wavelength in a rectangular waveguide working on TE <sub>01</sub> mode.		
48	REC651	To study measurement of reflection coefficient and standing wave ratio using double minima method.		
49	REC651	To study V-I characteristic of Gunn diode.		
50	REC651	To measure an unknown impedance with Smith chart.		
51	REC651	Study of Circulator/Isolator.		
52	REC651	Study of Attenuator (Fixed and Variable type).		
53	REC651	To study simple dipole / antenna and to calculate beam-width, front / back ratio, and gain of the antenna.		
54	REC651	To study folded dipole antenna and to calculate beam-width, front / back ratio, and gain of the antenna.		

55	REC651	To study / phase array end-fire antenna and to calculate beam-width, front / back ratio, and gain of the antenna.		
56	REC651	To study broadside array antenna and to calculate beam-width, front / back ratio, and gain of the antenna.		
57	REC652	To construct a Square wave with the help of Fundamental Frequency and its Harmonic component		
58	REC652	Study of pulse data coding & decoding techniques for NRZ and RZ formats.		
59	REC652	Study of Manchester coding and Decoding.		
60	REC652	Study of Amplitude shift keying modulator and demodulator.		
61	REC652	Study of Frequency shift keying modulator and demodulator.		
62	REC652	Study of Phase shift keying modulator and demodulator.		
63	REC652	Study of single bit error detection and correction using Hamming code.		
64	REC652	Study of Quadrature Phase shift keying modulator and demodulator.		
65	REC652	To simulate Differential Phase shift keying technique using MATLAB software.		
66	REC652	To simulate M-ary Phase shift keying technique using MATLAB software (example 8PSK, 16PSK) and perform BER calculations.		
67	REC652	To simulate convolutional coding using MATLAB software.		
68	REC652	Design a front end BPSK modulator and demodulator.		
69	RIC653	Different Toolboxes in MATLAB, Introduction to Control Systems Toolbox or its equivalent open source freeware software like Scilab using Spoken Tutorial MOOCs		
70	RIC653	Determine transpose, inverse values of given matrix.		
71	RIC653	Plot the pole-zero configuration in s-plane for the given transfer function.		
72	RIC653	Determine the transfer function for given closed loop system in block diagram representation.		

73	RIC653	Plot unit step response of given transfer function and find delay time, rise time, peak time and peak overshoot.		
74	RIC653	Determine the time response of the given system subjected to any arbitrary input		
75	RIC653	Plot root locus of given transfer function, locate closed loop poles for different values of k. Also find out $\omega_d$ and $\omega_{nat}$ for a given root.		
76	RIC653	Create the state space model of a linear continuous system		
77	RIC653	Determine the State Space representation of the given transfer function		
78	RIC653	Plot bode plot of given transfer function. Also determine the relative stability by measuring gain and phase margins.		
79	RIC653	Determine the steady state errors of a given transfer function.		
80	RIC653	Plot Nyquist plot for given transfer function and to discuss closed loop stability. Also determine the relative stability by measuring gain and phase margin.		
81	RIC651	Write a program of Flashing LED connected to port 1 of the 8051 Micro Controller		
82	RIC651	Write a program to generate 10 kHz square wave using 8051.		
83	RIC651	Write a program to show the use of INT0 and INT1 of 8051		
84	RIC651	Write a program for temperature & to display on intelligent LCD display		
85	RIC651	Write a program to generate a Ramp waveform using DAC with micro controller.		
86	RIC651	Write a program to Interface GPIO ports in C using MSP430 (blinking LEDs , push buttons)		
87	RIC651	Write a program Interface potentiometer with GPIO.		

88	RIC651	Write a program of PWM based Speed Control of Motor controlled by potentiometer connected to GPIO		
89	RIC651	Write a program of PWM generation using Timer on MSP430 GPIO		
90	RIC651	Write a program to Interface an accelerometer.		
91	RIC651	Write a program using USB (Sending data back and forth across a bulk transfer-mode USB connection.)		
92	RIC651	Write a program for Master Slave Communication between 2 MSP430s using SPI		
93	RIC651	Write a program of basic Wi-Fi application – Communication between two MSP430 based sensor nodes		
94	RIC651	Setting up the CC3100 as a HTTP server.		
95	RIC651	Review of User APIs for TI CC3100 & Initialization and Setting of IP addresses		



