

UNDERGRADUATE PROGRAMME IN ELECTRONICS

EL-;	Electronic Instrumentation	Total Periods: 48
Unit 1		(P-12)
Quality of measurement: units: S. I. System of units, dimensions and standards; errors in measurement, types of static error, sources of error, dynamic characteristics and statistical analysis. Dc and ac bridges: Wheatstone, Wein's bridge, Kelvin single and double bridge, Maxwell bridge, hey bridge and Schering bridge.		
Unit 2		(P-12)
Basic measurement instruments: dc measurement: dc voltmeter, ohmmeter and ammeter. Digital type voltmeter, ammeter and ohmmeter, digital multimeter, ac measurement, voltmeter, ammeter. Digital frequency counter, elements of frequency meter, universal counter and its different modes, measurement errors and extending the frequency range.		
Unit 3		(P-12)
Electronic displays: the cathode ray oscilloscope (CRO): block diagram of a general purpose oscilloscope and its basic operation, electrostatic focusing and deflection, screen for CRT and graticules, CRT connections, CRO probes. Types of CRO's: dual trace oscilloscope, sampling oscilloscope		
Unit 4		(P-12)
Signal generators: types of generators and their operation: audio oscillator, function generators, pulse generators Transducers:: introduction to different types of transducers, temperature transducers, resistance thermometers, thermocouple, thermistor and semiconductor p-n junction transducer, light transducers: photoresistors, photovoltaic cells, photodiodes. Essential Text: UNIT 1 CHAPTERS 1,11- H. S. Kalsi, Electronic Instrumentation, Tata Mcgraw Hill (2006) UNIT 2 CHAPTER 3,4, 5, 6- H. S. Kalsi, Electronic Instrumentation, Tata Mcgrawhill (2006) UNIT 3 CHAPTER 2, 7- H. S. KALSI, Electronic Instrumentation, Tata Mcgrawhill (2006) UNIT 4 CHAPTERS8, 13- H. S. KALSI, Electronic Instrumentation, Tata Mcgrawhill (2006)		

Suggested books:

1. Joseph j Carr, elements of electronic instrumentation and measurement, pearson education (2005)
2. C. S. Rangan, G. R. Sarma and V. S. Mani, instrumentation devices and systems, Tata Mcgraw Hill (1998)
- 3.. H. Cooper, modern electronic instrumentation and measurement techniques, Pearson Education (2005)
- 4.. R. A. Witte, electronic test instruments: analog and digital measurements, Tata Mcgraw Hill (2004)
5. S. Wolf and R. F. M. Smith, student reference manual for electronic instrumentation laboratories, Pearson Education (2004)

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EL-8 Practicals Electronic Instrumentation

1. To study the variations of thermo-emf of a thermocouple with difference in temperature of its two junctions.
2. To calibrate a thermocouple to measure temperature in a specified range using null method and direct measurement using op-amp.
3. Frequency measurement using change in resistance using LDR.
4. Study of Wein bridge oscillator.
5. Study of De Sauty's bridge .
6. Study of Anderson's/Careyfoosterbridge .
7. Design of multi range ammeter using galvanometer.
8. Design of multi range voltmeter using galvanometer.