

**HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN**  
**B. Sc. PHYSICS - SEMESTER – II**  
**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**  
**PROGRAMME CODE: SCIUG101 COURSE CODE:SC23SECPHY206**

**COURSE NAME: Electronic Circuit Elements and Energy Sources**  
(Effective from June 2023 Under NEP – 2020)

Total Credits: 02	Theory	External Marks – 25
Teaching Hours per Week: 02		Internal Marks – 25
Teaching Hours per Semester:30		

Unit No.	Content	Credit	Lect Hrs 30
Unit-1	<p><b>RESISTOR:</b> Generals (6.1), Resistor type, Wire wound resistor, Carbon composition resistor, Carbon film resistor, Cermet film resistor, Metal film resistor, Power resistor, Value tolerance, Variable resistor, Potentiometer and Rheostats, Fusible resistor., Resistor color, resistor, Color band, Resistor under ten ohm, Resistor. Troubles, Checking resistor with ohmmeter.</p> <p><b>CAPACITOR:</b> Capacitors, Capacitor connect to battery, Capacitance, Factors controlling capacitance, Type of Capacitors, Fixed Capacitor, Variable capacitors, Voltage rating of capacitors, Stray circuit cap. Leakage resistance, Troubles Capacitor, Checking capacitor with ohm meter.</p> <p><b>INDUCTOR:</b> Inductor, Comparison of different coils, Inductance of an inductance, Another definition of inductance, Mutual inductance, Coefficient of coupling, Variables inductors, Inductor in series and parallel without M, Series combination with m, Stray inductance, Energy storage magnetic field, DC Resistance of coils.</p>	1	15
Unit-2	<p><b>CELLS AND BATTERY:</b> Primary and Secondary cells and Battery's, Voltage and current of cell, Cell life, Different type of dry cells, Carbon zinc cell, Alkaline cell, Manganese alkaline cell, Nickel cadmium cell, Mercury cell, Silver oxide cell, Lead acid cell, Battery rating, Testing dry cell, Photo electric cell, Solar cell</p> <p><b>TRANSFORMER:</b> Introduction, Type of Transformer, Construction of Transformer, Transformer working, Transformer impedance, Can a Transformer Operate on DC RF Shielding, Auto Transformer</p>	1	15
<b>Basic Reference:</b> <i>Basic Electronics by B. L. Theraja, Pub. S. Chand &amp; Company 3<sup>rd</sup> Edition</i>			

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**B. Sc. PHYSICS - SEMESTER – II**  
**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**  
**PROGRAMME CODE: SCIUG201      COURSE CODE:SC23SECPHY207**

**COURSE NAME: MEASUREMENT SYSTEMS**  
(Effective from June 2023 Under NEP – 2020)

Total Credits: 02	Theory	External Marks – 25
Teaching Hours per Week: 02		Internal Marks - 25
Teaching Hours per Semester: 30		

**:: Syllabus ::**

Sr. No	Content	Credit	Lec. Hrs 30
Unit 1	<b>Instrumentation;</b> Measurement, Significance of measurement, Types of measurement: direct, indirect, analog, digital; Null and Detection Method; Functional block diagram of measurement system; Examples, Rudimentary Pressure Gauge; Bourdon Tube thermometer; Input-Output configuration; Desired interfacing and modifying input; General scheme; Examples; Method of corrections; Method of higher gain feedback; Signal filtering; Opposing inputs; computed correction and inherent sensitivity.	1	15
Unit 2	<b>Statics Characteristics:</b> Static calibration; Static characteristics; Accuracy & Precision; bias; Combination of Component error in overall system; Accuracy; Calculation; Addition; Subtraction; Multiplication; & Division Errors: Errors, Absolute and Relative; Types of error; Gross error; Systematic and Random error; Method of correction; Statistical analysis curve; Probable error limiting error.	1	15
<b>Reference Book:</b> 1) E.O. Doblin, Measurement Systems, Mc Graw Hill, 2) A.K. Sawhney, Instrumentation, 3) Gopal Krishna Banerjee, Electrical and Electronic Measurement, PHI, New Delhi, 4) Introduction to Measurement and Instrumentation, 3" Ed, Arun K Ghose, PHI, New Delhi			