SARDAR PATEL UNIVERSITY
Syllabus Structure B.Sc. Semester: I
With Effect from: June – 2023
Bachelor of Science
B.Sc. Electronics and Communication Semester I
(Major subject- Minor subject - Interdisciplinary subject)

Course Code	**US01MAELC01**	**Title of the Course**	**Electronic Measurement and Instrumentation**
Total Credits of the Course	**04**	**Hours per Week**	**04**

Programme Outcome (PO) - For B.Sc. Electronics and Communication Programme	1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020. 2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities. 3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur. 4. At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students. 5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students. 6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements. 7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice. 8. The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.
Programme Specific Outcome (PSO) – B.Sc. (Electronics and Communication) Programme	1. To improve the scientific awareness among the students. 2. To make students to understand the role and contribution of Electronics and Communication in the development of science and technology. 3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and data as well as results obtained. 4. To help students in understanding the concepts of Electronics and

	Communication. 5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems. 6. To understand the conceptual development of the subject and thereby develop the interest in the subject. 7. To create interest in the subject and improve technological aspect through mini projects, projects, models, demonstrations, etc. 8. To create interest in the subject to continue to work in the field of science particularly in Electronics and Communication. 9. To motivate students to make career in Electronics and Communication.

Course Objectives:	1. In this course, students will be learning about the electronics instrument which were used in our day to-day life. 2. To understand the basics of semiconductor components like resistor, capacitor and inductor their applications will be introduced.

Course Content		
Unit	**Description**	**Weightage* (%)**
1.	**Instruments and Measurement**: Definition, Application and Methods of measurements, instrument classification, Functional Elements of an instrument.	**25%**
2.	**Measurement Errors:** Accuracy, precision, resolution and significant figures, Gross error, systematic error, absolute error and relative error, guaranteed error.	**25%**
3	**DC & AC Measurement**: Galvanometers, Analog Ammeter, Voltmeter, PMMC, Moving Iron, Electrostatic, Ohmmeter, AC voltmeter using rectifier, true RMS voltmeter, Digital VOM meter. Cathode Ray Oscilloscopes: Block Schematic, Principles and applications.	**25%**
4	**Resistance, Capacitance, and Inductance Measurements**: Voltmeter and ammeter methods, Wheatstone bridge, low, medium and high resistance measurements, AC bridge theory, capacitance bridges, Inductance bridges, Q meter.	**25%**

Teaching-Learning Methodology	Direct Teaching through Chalk-Walk and Talk ICT enabled teaching Question-Answer Class discussion led by teacher/students Case Studies Literature review Problem solving activities Debate Collaborative and Co-operative Learning Think Pair Share Jigsaw Inquiry Based Learning Panel Discussion Project Based Learning Flipped Classroom Blended Learning designs Concept Mapping

Evaluation Pattern		
Sr. No.	**Details of the Evaluation**	**Weightage**
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: On the successful completion of the course, the students will be able to understand

Suggested References:	
Sr. No.	**References**
1.	Electronic Instrumentation & Measurement by William D Cooper & Albert C. Helfric, PHI Publications
2.	Electrical and Electronic Measurements and Instrumentation by A. K Sawhne, Dhanpar Rai & Co.
3.	Electronic Measurements and Instrumentation by R.S. Sedha, S. Chand Publications

On-line resources to be used if available as reference material
On-line Resources:
https://nptel.ac.in/courses/115/106/115106119/
https://ocw.mit.edu/resources/res-6-005-understanding-lasers-and-fiberoptics-spring-2008/laser-fundamentals-i/ https://nptel.ac.in/courses/104/104/104104085/
https://www.electronics-tutorials.ws/ https://www.electronicshub.org/tutorials/ www.allaboutcircuits.com

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Course Code	**US01MAELC02**	**Title of the Course**	**Electronics and Communication Practical**
Total Credits of the Course	**04**	**Hours per Week**	**08**

Course Content		
Sr. No.	**List of Experiments**	**Weightage* (%)**
1.	Carry out Statistical Analysis of Digital Voltmeter • Calculate mean, standard deviation, average deviation, and variance. • Calculate probable error	
2.	Resistance measurement using Wheatstone bridge.	
3	Measure Q and dissipation factor using LCR meter.	
4	Capacitance measure using Schering bridge.	
5	Inductance measure using Maxwell bridge.	
6	Measurement of strain using strain gauge.	
7	Use of Cathode ray Oscilloscope CRO.	
8	Study Lissajous patterns using Cathode ray Oscilloscope (CRO).	
9	Phase angle using Cathode ray Oscilloscope (CRO).	
10	Propagation of Error.	