

DEPARTMENT OF TECHNOLOGY EDUCATION, IER
University of the Punjab, Lahore
Course Outline

Programme	BS Technology Education	Course Code	BSTE302	Credit Hours	3
Course Title	Basic Electricity				
Course Introduction					
This course covers the fundamentals of electricity, including basic concepts, circuits, and devices. Students will learn to analyze and apply electrical principles to solve problems and understand the basics of electrical systems.					
Learning Outcomes					
Upon completing this course, students will be able to:					
1. Define basic electrical terms and concepts					
2. Identify and explain the functions of electrical components					
3. Analyze and solve simple electrical circuits					
4. Understand and apply Ohm's Law and Kirchhoff's Laws					
5. Explain the principles of series and parallel circuits					
6. Identify and explain the functions of electrical devices and appliances					
Course Content				Assignments/Readings	
Week 1	Unit-1.1			Define electricity and explain its importance in daily life.	
	Definition of Electricity, History, and Importance				
	Unit-1.2				
Week 2	Electric Charges, Conductors, and Insulators				
	Unit- 2.1				
	Electric Circuits, Voltage, and Current				
Week 3	Unit- 2.2				
	Ohm's Law, Resistance, and Power				
Week 3	Unit-3.1			Analyze a series circuit and calculate voltage, current, and resistance.	
	Series and Parallel Circuits				

	Unit- 3.2 Circuit Analysis, Kirchhoff's Laws	
Week 4	Unit- 4.1	
	Network Theorems, Thevenin's and Norton's Theorems	
	Unit- 4.2	
	Maximum Power Transfer Theorem	
Week 5	Unit- 5.1	
	Resistance, Resistivity, and Temperature Coefficient	
	Unit- 5.2	
Week 6	Conductance, Siemens, and Mho's	Calculate the equivalent resistance of a resistor network.
	Unit- 6.1	
	Resistance Color Coding and Tolerances	
	Unit- 6.2	
Week 7	Resistors in Series and Parallel	
	Unit-7.1	
	Capacitance, Capacitors, and Dielectrics	
Week 8	Unit-7.2	
	Capacitor Types, Series, and Parallel	Calculate the capacitance of a parallel plate capacitor.
	Unit-8.1	
	Inductance, Inductors, and Magnetic Fields	
Week 9	Unit-8.2	
	Inductor Types, Series, and Parallel	
	Unit-9.1	
Week 10	Alternating Current, Frequency, and Period	
	Unit-9.2	
	AC Waveforms, Peak and RMS Values	
Week 11	Unit-10.1	Calculate the impedance of an AC circuit.
	Phasors, Impedance, and Admittance	
	Unit-10.2	
Week 12	Power in AC Circuits, Active and Reactive Power	
	Unit-11.1	
Week 13	Series and Parallel AC Circuits	Analyze an AC circuit using node analysis.

	Unit-11.2 AC Circuit Theorems, Superposition, and Thevenin's		
Week 12	Unit-12.1 AC Circuit Analysis, Node and Mesh Analysis		
	Unit-12.2 AC Circuit Applications, Filters, and Transformers		
Week 13	Unit-13.1 Electrical Measurements, Instruments, and Errors	Identify and explain the use of different electrical measuring instruments.	
	Unit-13.2 Voltmeters, Ammeters, and Ohmmeters		
Week 14	Unit-14.1 Multimeters, oscilloscopes, and Logic Probes		
	Unit-14.2 Measurement Techniques, Safety, and Precautions		
Week 15	Unit-15.1 Electrical Safety, Precautions, and First Aid	Design and present an electrical project, such as a simple circuit or a wiring diagram.	
	Unit-15.2 Electrical Wiring, Sockets, and Switches		
Week 16	Unit-16.1 Electrical Machines, Motors, and Generators		
	Unit-16.2 Review, Practice Problems, and Final Project		
Textbooks and Reading Material			
1. Basic Electricity by C.L. Chung 2. Electricity and Electronics by R.J. Smith 3. Fundamentals of Electric Circuits by C.A. Desoer			
Teaching Learning Strategies			
1. Use Relatable Analogies: Explain complex electrical concepts using everyday analogies, such as comparing voltage to water pressure. 2. Visual Aids: Utilize diagrams, charts, graphs, and illustrations to help students visualize electrical circuits and concepts. 3. Hands-on Activities: Incorporate hands-on experiments, simulations, and projects to engage students and illustrate key concepts. 4. Real-World Applications: Show students how electrical concepts are applied in practical scenarios, making the			

material more relevant and interesting.			
Assessment			
Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.