Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor valuation I	Minor valuation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251101	DC	Instrumentation & Sensors	25	25	20	30			100	2	1		3

Instrumentation & Sensors (14251101)

Course Objectives:

To understand the significance of measurement techniques, errors in measurement, and statistical analysis process, sensors, classification, operating principles, and their practical use in Modern Communication Systems.

Unit I: Measurement Systems: Introduction, Significance of measurement, block diagram of measurement system, methods of measurements, elements and their functions of measurement systems, applications, characteristics of measurement systems-static and dynamic, Static characteristics- accuracy, precision, sensitivity, reproducibility, drift, static error, dead zone, linearity, resolution, hysteresis, loading effects, Dynamic characteristics- Speed of response, measuring lag, fidelity, dynamic error, calibration.

Unit II: Errors in Measurement and their Statistical Analysis: Types of Error- Gross, Systematic (Instrumental, Environmental, Observational error), and random error, Statistical treatment of data-measurement tests, histogram, arithmetic mean, dispersion measurement, range, deviation, average deviation, standard deviation, variance, Noise, signal to noise ratio.

Unit III: Thermal & Proximity Sensors: Introduction, Sensor Classifications, Sensors Parameters, Selection criterion of Sensors, General requirements for interfacing, Temperature sensors, Thermo resistive sensors- Resistance Temperature Detectors, Thermistor, Thermoelectric sensors- Thermocouple, Electric Sensors- Capacitive position and displacement sensors, LVDT, Proximity sensors: Inductive and Capacitive.

Unit IV: Force, Pressure, Humidity, and Moisture Sensors: Force sensor- Strain gauge**,** Semiconductor strain gauge**,** Strain gauge accelerometers, Pressure sensors- Mechanical pressure sensors, Piezoresistive pressure sensor, Capacitive pressure sensor, Resistive humidity sensor, capacitive moisture sensors, Thermal conduction moisture sensors.

Unit V: Sensors in Modern Communication Systems: Role of sensors in modern telecommunication systems (5G/6G, IoT, WSNs), Reconfigurable sensors, Terahertz and Photonic Sensors, Quantum sensors and optical sensors and its role in secure 6G communication.

Text Book:

1. A.K. Sawhney: "A Course in Electrical and Electronic Measurements and Instrumentation", 18th Edition, Dhanpat Rai Publications, 2001.
2. Nathan Ida, "Sensors, Actuators and Their Interfaces, A multidisciplinary introduction", 2nd Edition, IET Publication.

Reference Books:

1. Subhash Chanda Mukhopadhyay, "Intelligent Sensing, Instrumentation and Measurements," Springer Publication.
2. Sanjay N. Talbar, Akhilesh R. Upadhyay, Instrumentation and Measurement, Dhanpat Rai Publishing Company. Third Edition 2004.
3. Process Control Instrumentation Technology, Curtis D. Johnson, PHI
4. A Hands-On Course in Sensors Using the Arduino and Raspberry Pi, Volker Zeimann, CRC Press.
5. Jon S. Wilson: "Sensor Technology Handbook", 1st Edition, Newnes (Elsevier)

Course Outcomes

After completion of this course students will be able to:

CO1: **Analyze** the measurement systems, significance, and their characteristics.
CO2: **Evaluate** the errors in measurement systems.
CO3: **Compare** the working principles of different sensors.
CO4: **Differentiate** the operation of force, pressure, humidity & moisture sensors with their applications.
CO5: **Integrate** advanced sensors in modern communication systems.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	2	2	-	-	-	-	-	-	1	1	2
CO2	3	3	-	3	2	-	-	-	-	-	-	2	1	2
CO3	3	2	2	2	3	-	-	-	-	-	-	2	1	2
CO4	3	2	2	2	3	-	-	-	-	-	-	1	1	2
CO5	3	2	2	2	3	2	1	-	-	-	2	3	1	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor valuation I	Minor valuation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251102	DC	Computer Programming	25	25	20	30			100	2	1		3

Computer Programming (14251102)

Course Objectives:

Equip students with the skills to design and implement programming solutions in C++ using fundamental algorithms, approaches, and documentation techniques.

Unit I: Introduction to Programming: Types of computer programming languages, Program Execution and Translation Process, Problem solving using Algorithms and Flowcharts. Introduction to C++ Programming: Data Types, Constants, Keywords, variables, input/output, Operators & Expressions, Precedence of operators.

Unit II: Control Statements and Decision Making: Conditional statements: if, if-else, nested if, Switch statement with break and default, Loops: while, do-while, for, nested for, Loop control: break, continue, return, Decision making using logical operators, Real-world examples and applications of control structures.

Unit III: C++ Functions: Function Declaration and Definition, Function syntax, Parameter types and names, Return types and values, Function Types, Function Scope and Lifetime, Function Templates, Recursion, Recursive function definition.

Unit IV: Strings, Arrays and Pointers: C-style strings (character arrays), C++ string class, Declaring and initializing strings, String operations. One-dimensional and multi-dimensional arrays, Array declaration and indexing, Array-based operations: sorting, searching. C++ Pointers: Basics of Pointers & Addresses, reference variable, Pointer to Pointer, Pointer to array.

Unit V: Advanced Programming Concepts in C++: Basics of graphics libraries (SFML, SDL, OpenGL), Event-driven programming and game loops. Using C++ for performance-critical parts of ML/DL applications. Interfacing with system APIs (Linux syscalls, Windows API).

Text Books:

1. C++ How to Program, H M Deitel and P J Deitel, Prentice Hall.
2. Programming with C++, D Ravichandran, T.M.H.
3. Computing Concepts with C++ Essentials, Horstmann, John Wiley.

Reference Books:

1. The Complete Reference in C++, Herbert Schildt, TMH.
2. Object-Oriented Programming in C++, E Balagurusamy.
3. Fundamentals of Programming C++, Richard L. Halterman.
4. Quinn, R., 2020. Advanced C++ programming cookbook Packt Publishing Ltd.

Course Outcomes

After completing this, the students will be able to:

CO1: **Design** algorithms and flowchart for a given problem.
CO2: **Implement** the concepts of procedural programming with control statements.
CO3: **Develop** optimized recursive functions & templates to solve challenging computational tasks.
CO4: **Implement** the pointer concept for effective C++ programming.
CO5: **Design** OOPs based industry oriented projects in C++.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	1	1	3	-	1	1	1	1	3	2	2
CO2	3	2	2	2	1	2	-	2	2	1	1	3	2	2
CO3	3	2	2	2	2	2	-	2	2	1	1	3	2	2
CO4	3	2	1	1	2	3	-	2	2	1	1	3	2	2
CO5	3	2	1	1	1	2	-	1	1	1	1	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor valuation I	Minor valuation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251103	DC	Electronics Devices	25	25	20	30			100	2	1		3

Electronics Devices (14251103)

Course Objective:

To understand the fundamental principles and operational characteristics of electronic devices, and apply this knowledge in advanced electronic circuits and its applications.

Unit I: Semiconductors Diodes: P-N Junction Diode properties and Characteristics, Breakdown mechanism, Capacitance of junction barrier, Diode Applications: Rectifiers, Clippers, Clampers and Voltage multiplier.

Unit II: Types of P-N junction Diodes: Basic operation and characteristics of; Zener diode, Zener diode as a voltage regulator, Tunnel diode, Varactor diode, Schottky diode, Light emitting diode, Photo-diode and their applications.

Unit III: **Bipolar Junction Transistors;** Construction and operation of BJT, CB, CE and CC configuration, input and output characteristics, Early effect, Regions of operation, Transistor as an Amplifier and switch, BJT Biasing and Stability.

Unit IV: Field Effect Transistor- JFET: Construction, n-channel and p-channel, transfer and drain characteristics, parameters, Equivalent model and voltage gain, CG, CS and CD configuration. Enhancement and Depletion MOSFET drain and transfer Characteristics.

Unit V: Advance semiconductor devices: Introduction to Organic LED, Fin-FET, Tunnel FET, High Electron Mobility Transistor (HEMT) and their applications.

Text Books:

1. Electronics Devices and Circuits: Boylested & Nashelsky, 11th Edition**,** Pearson Education India
2. Electronic devices and circuits: S. Salivahanan, 2nd Edition, Tata McGraw-Hill Education, 2011.
3. Microelectronic Circuits: Theory and Application: Sedra & Smith, 7th Edition**,** Oxford University Press.
4. Integrated Electronics: Millman &Halkias, McGraw Hill Education

Reference Books:

1. Micro Electronics: Millman, & Grabel, 2nd Edition, McGraw Hill Education
2. Yuan Taur and Tak H. Ning:"Fundamentals of Modern VLSI Devices", Cambridge University Press, 2nd Edition.
3. Fundamentals of Tunnel Field-Effect Transistors: Sneh Saurabh and Mamidala Jagadesh Kumar, 1st Edition, CRC Press
4. Computational Electronics: Semiclassical and Quantum Device Modeling and Simulation: Dragica Vasileska, Stephen M. Goodnick, Gerhard Klimeck, 1st Edition, CRC Press

Course Outcomes

After the completion of this course students will be able to:

CO1. **Design** the application circuits using PN junction diode.
CO2: **Analyze** the construction, operation, and characteristics of various diodes
CO3. **Compare** Bipolar Junction Transistors (BJT) configurations.
CO4. **Differentiate** JFET and MOSFET configuration.
CO5. **Compare** advanced semiconductor devices with their potential applications.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	2	1	1	2	2	1	1	-	3	3	3
CO2	3	3	3	3	2	2	2	2	2	1	2	3	3	3
CO3	3	3	2	3	3	3	2	1	2	1	3	3	3	3
CO4	3	3	3	3	3	3	-	1	2	1	3	3	3	3
CO5	3	3	2	1	2	3	-	1	2	1	1	3	2	2

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor valuation I	Minor valuation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251104	DC	Network Theory	25	25	20	30			100	2	1		3

Network Theory (14251104)

Course Objective:
The course introduces analysis of static linear circuits using mesh, node, KVL, KCL and theorems along with transient analysis and time varying input. Also covers two-port networks and impedance matching for wireless communication applications.

Unit 1: Method of analysis: Node analysis, Node analysis using Supernode, Mesh analysis, Mesh analysis using supermesh, Graph theory.

Unit 2: Circuit Theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Duality theorem, Substitution theorem.

Unit 3: Transient analysis: First order circuits, Transients in RL, RC and RLC circuits, initial conditions, time constants, Steady state analysis, Source free RC circuit, Source free RL circuit, Step response of an RL, RC, RLC circuit, Transient and Steady State analysis using Laplace transform.

Unit 4: Two port networks: Concept of Ports, Calculation of network functions for one port and two port, Two port parameters – Z, Y, hybrid and chain Parameters, Relationship between two port network parameters, T and π networks, Characteristics impedance & propagation constant.

Unit 5: Matching networks in wireless module: Impedance matching techniques, Lumped Element matching (L, C networks) Equalizer & attenuator.

Text Books:

1. Circuit Theory: Analysis and Synthesis: A. Chakrabarti, 7th Edition, Dhanpat Rai Publication.
2. Network and Systems: D. Roy Chaudhary, 2nd Edition, New Academic Science Ltd.
3. Fundamentals of Electric Circuits: Matthew N.O. Sadiku, 5th Edition, McGraw Hill edition.

Reference Books:

1. Network Analysis: M.E. Van Valkenberg, 3rd Edition, Prentice Hall of India.
2. Network Theory and Filter Design: V. K. Aatre, 2nd Edition, John Wiley & Sons.
3. Microwave Transistor Amplifiers: Analysis and Design: Guillermo Gonzalez, 1st Edition, Pearson College Div
4. RF Circuit Design: Theory and Applications: Reinhold Ludwig and Pavel Bretchko, 1st Edition, Pearson

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

CO1: **Apply** node and mesh analysis techniques to solve electrical circuits.
CO2: **Analyze** electrical circuits using various network theorems.
CO3: **Evaluate** the transient response of first-order and second-order electrical circuits.
CO4: **Calculate** two port parameter of the electrical circuits.
CO5: **Compare** impedance matching techniques for network performance.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	1	-	2	1	-	1	-	3	3	1
CO2	3	3	3	3	2	-	2	1	-	1	-	1	3	1
CO3	3	3	3	3	3	-	-	1	-	1	-	2	3	1
CO4	3	3	3	2	3	-	-	1	-	1	-	1	3	1
CO5	3	3	3	3	3	-	-	1	-	1	2	2	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor valuation I	Minor valuation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251105	DC	Basic Electrical & Electronics Engineering	25	25	20	30			100	2	1		3

Basic Electrical & Electronics Engineering (14251105)

Course Objectives:

- Impart foundational knowledge in Electrical and Electronics Engineering.
- Enable students to analyze electric circuits, understand electrical machines, and implement digital systems.
- Explore emerging applications in industrial automation, smart grids, and renewable systems.

Unit I D.C. Circuits Analysis: Voltage and Current Sources: Dependent and independent source. Source conversion. Kirchhoff's Law, Mesh and Nodal analysis. Network theorems: Superposition theorem, Thevenin's theorem & Norton's theorem and their applications.

Unit II Single-phase AC Circuits: Generation of sinusoidal AC voltage, definitions: Average value, R.M.S. value, Form factor and Peak factor of AC quantity, Concept of Phasor, analysis of R-L, R-C, R-L-C Series and Parallel circuit, Power and importance of Power factor, Resonance in AC circuits.

Unit III Transformer & Electrical Machines: Magnetic Circuits and Electromagnetism, Transformers: Construction, principle, types, losses & efficiency, OC & SC test DC Machines: Motor and Generator working Principles, Characteristics, Introduction to Induction Motors and Synchronous Machines.

Unit IV Digital Electronics, Devices & Circuits: Number Systems, Logic Gates and Truth Tables, Diodes, Transistors (BJT, FET, MOSFET), Multiplexers, Demultiplexers, Flip-Flops, Counters.

Unit V Emerging Trends and Applications: Smart Grids and Smart Meters, Application of Motors in Industrial Automation, Electric Vehicles and Renewable Systems, Sensors and Basic IoT Applications.

Recommended Books:

1. Basic Electrical and Electronics Engineering, D.P. Kothari &I.J. Nagrath-Tata McGraw Hill
2. Basic Electrical and Electronics Engineering, V N Mittle& Arvind Mittal -Tata McGraw Hill
3. Basic Electrical and Electronics Engineering, S. K Bhattacharya -Pearson
4. Principles of Electrical Engineering- Vincdent Del Toro- Prentice Hall.
5. Basic Electrical Engineering -A,E. Fitzgerald, Higginbotham and Grabel -TMH

Course Outcomes:

At the end of the course, the student will be able to:

CO1: **Apply** fundamental laws and network theorems to analyze DC circuits

CO2: **Analyze** single-phase series & parallel AC circuits for calculation of power, power factor, and resonance conditions.

CO3: **Explain** the working principles, construction, and operational characteristics of transformers, DC machines, and induction motors.

CO4: **Design** basic digital logic circuits using logic gates, flip-flops, and counters

CO5: **Discuss** the concepts of smart grids, electric vehicles, and IoT systems to emerging industrial applications in automation and renewable energy systems.

Course Articulation Matrix

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	1	-	-	-	-	-	-	1		
CO2	3	3	2	2	1	-	-	-	-	-	-	1		
CO3	3	2	3	2	2	1	-	-	-	-	-	2		
CO4	3	3	3	2	1	-	-	1	2	2	-	1		
CO5	3	2	3	2	3	2	2	2	-	1	1	2		

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor valuation I	Minor valuation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251106		Computer programming					70	30	100	-	-	2	1

Subject Name: Computer Programming Lab
Subject Code: 14251106

Course Objectives:

Equip students with the skills to design and implement programming solutions in C++ using fundamental algorithms, approaches, and documentation techniques.

List of Experiments

1. Write a Program to perform addition, subtraction, multiplication and division of integer and floating values.
2. Write a Program to perform swapping between two user entered values without using third variable.
3. Write a Program to take temperature from the user in Fahrenheit, then convert and display the temperature in Celsius and Kelvin.
4. Write a Program to calculate and display Simple Interest where the principle, rate and time are given by the user.
5. Write a Program to check and display whether a user entered number is divisible by 30 or not (using nested if).
6. Write a Program to find and display the greatest number among the three numbers entered by the user.
7. Write a Program to check and print whether a user entered number is negative, positive or zero.
8. Write a Program to print whether a user entered character is vowel or consonant using switch-case.
9. Write a Program to print mathematical table of a user entered number (example, 5*1=5) (for loop).
10. Write a Program to find factorial of a user entered number using while loop.
11. Write a Program to print all the numbers between 1 to 100 whose sum of the is even (do-while loop).
12. Write a Program to print the maximum and minimum element of a user entered 1D array and sort the array elements in ascending and descending order.
13. Write a Program to search an element and print its position in a user entered 2D array.
14. Write a Program for a Basic Bank Management System having customer account creation, deposit, withdrawal, and balance inquiry functionalities using OOPs in C++.
15. Write a Program for a Vehicle Rental System which allows booking, returning, and viewing available vehicles using OOPs in C++.

Course Outcomes:

After completing the lab, students will be able to:

CO1. **Conduct** investigations through systematic performance of experiments.
CO2. **Demonstrate** ethical behaviour and communicate effectively during viva sessions
CO3. **Acquire** teamwork skills for working effectively in groups
CO4. **Prepare** technical report on experiments conducted in the lab.

CO-PO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3									1			2	2
CO2								3		3				
CO3									3	1				
CO4										1		2		

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251107	DLC	Electrical & Electronics Engineering Lab	-	-	-	-	70	30	100	-	-	2	1

Subject Name: Electrical & Electronics Engineering lab
Subject Code: 14251107

Course Objectives:
This course gives the ability to the students to apply various laws and theorems to solve network circuits.

List of Experiment

1. To verify Kirchhoff's Current Law & Kirchhoff's Voltage Law.
2. To verify Superposition Theorem
3. To determine resistance & inductance of a choke coil.
4. To determine active & reactive power in a single phase A.C circuit.
5. To determine voltage ratio & current ratio of a single phase transformer.
6. To determine the polarity of a single phase transformer.
7. To perform open circuit & short circuit test on a single phase transformer.
8. To study multimeter & measure various electrical quantities
9. To study of constructional details of DC machine.
10. To determine the V-I characteristics of diode in forward bias & reverse bias condition.
11. To determine phase and line quantities in three phase star and delta connection
12. To study of effect of open and short circuits in simple circuits
13. To plot Transistor CB characteristics (Input and Output)
14. To plot Transistor CE characteristics (Input and Output)
15. Study the output characteristics of a solar PV panel under varying conditions
16. Develop a simple IoT system to monitor temperature and humidity using sensors.

Course Outcomes:
After the completion of the lab, the student will be able to –

CO1. **Demonstrate** the ability to operate lab equipment & instrument relevant to the electrical engineering field
CO2 **Collect** experimental data accurately and effectively in ethical manner
CO3 **Integrate** theoretical knowledge from coursework into practical applications and experiments
CO4 **Communicate** experimental results effectively through oral presentations and written documentation
CO5 **Demonstrate** responsibility and professionalism in the completion of lab tasks and assignments
CO6 **Show** willingness to learn new techniques, tools, or methods to enhance practical engineering skills

Course Articulation Matrix

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	3	3	3	2	-	-	-	2		
CO2	2	3	2	3	2	3	2	3	-	2	-	2		
CO3	3	3	3	3	2	2	2	2	2	3	2	3		
CO4	1	2	2	3	-	2	2	3	3	3	2	2		
CO5	-	-	1	2	-	3	3	3	3	3	2	3		
CO6	2	2	2	2	3	3	3	2	3	3	2	3		

1 - Slightly; 2 - Moderately; 3 – Substantially

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot		Total Marks	Contact Hr./week			Total Credits
			Minor valuation I	Minor valuation II	Quiz/ Assignment Marks	Major Evaluation	Continuous Evaluation/Lab work & Sessional	Major Evaluation		L	T	P	
14251109	DLC	Micro Project-I					70	30	100	-	-	2	1

Micro Project-I (14251109)

Subject Name: Micro Project-I
Subject Code: 14251109

List of Micro-projects

1. Automatic Street Light controller Using LDR
2. Burglar Alarm and smoke detector System
3. Digital Dice Using 555 Timer
4. Fire Alarm Using Thermistor
5. Touch-Activated Light Switch
6. IR-Based visitor counters
7. Fan Speed Controller Using Thermistor
11. Traffic Signal Controller Using Arduino
12. Line Follower Robot (Basic)
13. Temperature Display Using LM35 and Arduino
14. Automatic Hand Sanitizer Dispenser
15. Smart Dustbin Using Ultrasonic Sensor
16. Light Intensity Meter Using LDR and Arduino
17. Automatic Plant Watering System
18. Password-Based Door Lock System
19. Heartbeat Monitor Using Arduino
20. IR Remote Controlled Home Appliances
21. Simple FM Receiver
22. Morse Code Encoder and Decoder
23. IR Communication Between Two Microcontrollers
24. Bluetooth-Based LED Control
25. Walkie-Talkie Using Simple RF Modules
26. Voice-Controlled LED System Using Android App
27. Wireless Power Transfer (Inductive Coupling)
28. GSM-Based Location Tracker (Basic Concept)
29. RF-Based Wireless Switch
30. Basic Intercom System Using Op-Amps
31. Solar Mobile Charger
32. Solar-Powered LED Lighting System
33. Wind-Powered Battery Charger
34. Power Bank Using 18650 Cells
35. Automatic Night Lamp Using Solar Panel
36. Mini Inverter Circuit

37. Energy Saver for Room Lighting
38. Solar Tracker Using LDR
39. Bicycle Dynamo Charger
40. Emergency Light Using Rechargeable Battery
41. Design Half-Wave and Full-Wave Rectifier Circuits
42. Design and Implementation of Clipper and Clamper Circuits
43. 555 Timer-Based Flashing Lamps
44. Design of a 5V Regulated DC Power Supply
45. Light Detection Circuit Using LDR
46. Automatic Night Lamp Using LDR and Transistor
47. Flasher Circuit Using Transistors or 555 Timer
48. Rain Alarm Using Conductive Plates and Buzzer
49. Fire Alarm Using Thermistor or Temperature Sensor
50. Cleaning and wiping robots
51. Laser-Based Security Alarm System
52. Visitor Counter Using IR Sensors and 7-Segment Display
53. Water Level Indicator Using Probes and LEDs
54. Battery Charger Circuit Using Diodes and Voltage Regulator
55. Touch-Activated Switch Using BJT
56. Simple LED Blinker Using 555 Timer
57. Automatic Night Light Using Op-Amp Comparator
58. Temperature-Based Fire Detection Circuit
59. Electronic Dice Simulator Using LEDs
60. Temperature-Controlled Fan Using LM35 or Thermistor
61. LED cube for light show.
62. Create a weather information fetcher in Python.
63. Develop a C-based file transfer tool over TCP/IP.
64. Build a Python tool that fetches and displays a random quote of the day.
65. Create a simple login server in Java.
66. Develop a login system in C++.
67. Build a user sign-up and login backend in Python using JSON.
68. Design a Java application that locks personal notes behind a PIN.
69. Create a simple OTP-based validation system in Python.
70. Build a multi-user login system in C.
71. Develop a result analyzer in Java.
72. Create an attendance tracking system in Python.
73. Build an electricity billing system in C++.
74. Implement a fee management system in Java.
75. Create a mess billing software in Python.
76. Design a CLI-based Tic Tac Toe game in C++.
77. Build a Snake game in Python using the curses module.
78. Develop a Rock Paper Scissors tournament system in Java.
79. Construct a quiz game in C.
80. Library Book Management System using C++.