Introduction to Electronics Technology (20S)

Course Information

Instructor: Mr.Pulver
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Course Code: EXA20S
Credit: 1.0
Prerequisite: None, Grade 9 Introductory Recommended
Suggested Grade Level: Grade 10
Delivery Format: Classroom instruction, lab activities, and project-based learning

Course Description

This introductory course immerses students in the foundational principles of electronics technology through hands-on learning. Topics include DC circuit theory, component identification, instrumentation and measurement, schematic interpretation, soldering, and basic circuit analysis. Emphasis is placed on developing practical skills through fabrication, breadboarding, and real-world applications. This course serves as a gateway to advanced electronics and prepares students for subsequent courses in the Electronics Technology cluster.

General Learning Outcomes (GLOs)

- GLO 1: Health and safety practices
- GLO 2: Tools and materials
- GLO 3: Electronic components
- GLO 4: Equipment use and maintenance
- GLO 5: Schematic interpretation
- GLO 6: Electrical theory and circuit analysis
- GLO 7: Soldering and PCB fabrication
- GLO 8: Cross-curricular STEM integration
- GLO 9: Career awareness
- GLO 10: Sustainability awareness
- GLO 11: Ethics in technology
- GLO 12: Employability skills
- GLO 13: Technology trends and evolution

Unit Breakdown

Unit 1: Safety and Work Practices

- Electrical hazards and PPE
- Shop safety, WHMIS, emergency response
- Safe use of tools and soldering equipment

Unit 2: Electrical Quantities and Theory

- Voltage, current, resistance, power
- Ohm's Law and power equations
- Energy sources: cells, batteries, and configurations

Unit 3: Components and Measurement

- Resistors, capacitors, switches, fuses, diodes (intro)
- Color codes and value calculation
- Use of multimeters for measuring V, I, and R

Unit 4: Circuit Construction and Analysis

- Series, parallel, and combination circuits
- Voltage and current behavior in various networks
- Circuit troubleshooting and simulation software (optional: Tinkercad)

Unit 5: Schematic Reading and Breadboarding

- Schematic symbols and reading simple schematics
- Building circuits using solderless breadboards
- Basic project wiring and layout skills

Unit 6: Soldering and PCB Fabrication

- Soldering iron operation and safety
- Solder joint techniques and desoldering
- Etching or assembling basic printed circuit boards

Unit 7: Real-World Applications and Careers

- Electronics in home, automotive, and industry
- Roles: technician, technologist, engineer
- Guest speakers or career profiles

Unit 8: Sustainability and Emerging Trends

- E-waste and recycling considerations
- Green electronics and energy-efficient designs
- Nanotechnology in modern circuits

Unit 9: Capstone Project

- Design and construct a working electronic device (e.g., flashlight, tone generator, security alarm)
- Breadboarding → Schematic → Soldered PCB
- Final demonstration, written reflection, and presentation

Assessment and Evaluation

Category	Weight
Employability Skills	10%
Labs, Theory, and Skills	60%
Final Project (Capstone)	30%

Materials and Resources

- **Tools**: Breadboards, soldering stations, multimeters, wire strippers, hand tools
- **Supplies**: Resistors, capacitors, LEDs, switches, 9V batteries, perfboard or PCBs
- **Software (optional)**: Tinkercad, Multisim
- **Textbooks**: Electricity & Electronics (Gerrish et al.) or equivalent
- **Online Videos**: Soldering tutorials, Ohm's Law, DC circuit simulations