MOE-ITE Applied Subjects
Smart Electrical Technology

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Objectives of Smart Electrical Technology

- To engage students in a learning mode that best suits their learning styles and needs

- To provide students early exposure to possible post-secondary courses of study and future work opportunities.

Why take Smart Electrical Technology?

- Learning that is connected to real-life applications, mostly concrete and hands-on
- Taught and assessed in a mode N(T) students can excel in
- Aligned to ITE courses and industry needs

What will you learn?

- foundational knowledge of electrical circuits and systems and home automation systems in preparation for further engineering studies at postsecondary level

- skills and knowledge related to electrical technology and home automation that are of immediate interest, relevance and use in daily life

- applications of electrical and home automation technology in homes and built environments.

Unit 1 – Electrical Principles and Circuits

This section covers the basic principles of electricity, connection of simple electrical lighting circuits for residential premises and the use of multimeters to measure and monitor electrical quantities and test for electrical continuity.

1.1 Electrical Safety
1.2 Electric Circuits
1.3 Electric Circuit Laws
1.4 Electric Circuit Connections
1.5 Power and Energy in an Electric Circuit
1.6 Electric Power Sources
1.7 Electrical Hazards and Protection
1.8 Electrical Cables
1.9 Electrical Test Instruments
1.10 Conventional Lighting Circuits
1.11 Electrical Supply Systems

Unit 2 – Home Automation Systems

This section covers the common technology used in home automation and installing and programming for smart control of lighting circuits in homes.

2.1 Home Automation Basics
2.2 Basic Home Automation Devices
2.3 Network Topology and Z-Wave Command Class
2.4 Z-Wave Network Setup
2.5 Switching and Dimming
2.6 Timing and Sensing
2.7 Scene Control
2.8 Central Control and Visualisation
2.9 Home Automation Controllers
2.10 Basic Networking and Installing Mobile App
2.11 Controlling Electrical Loads and Security Features via Mobile Phone

Curriculum time and Assessment

- The total curriculum time for SET is 3 hours per week (120 hours) across 2 years.

- The final assessment will comprise both written examination and practical components constituting 30% and 70% respectively of the final score.

What dispositions might I have when considering to take SET?

- I have safety consciousness and safe working habits
- I would like to develop my analytical abilities and problem-solving skills
- I have an interest in a post-secondary engineering-based education

Upon graduation from my SET journey,

- I will have the ability to brainstorm ideas for problem solutions.
- I will be able to design and test conventional lighting circuits.
- I can debug and refine home automation controller algorithm to achieve desired control scenario.
- I will have the ability to explain and communicate programming solutions.

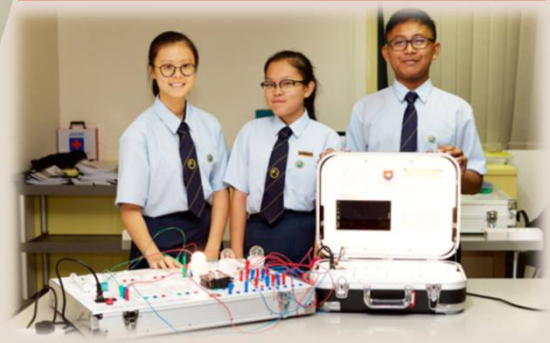
Smart Electrical Technology (SET)

Aims to equip students with the basic knowledge of electrical circuits and systems and skills in planning and designing a smart home using internet-and-phone enabled home automation technology/systems.

Electrical Principles and Circuits

- Electric Circuits Laws, Power and Energy in an Electrical Circuit, Electrical Hazards and Protection, Electric Cables, Electrical Test Instruments and Conventional Lighting Circuit.

Home Automation

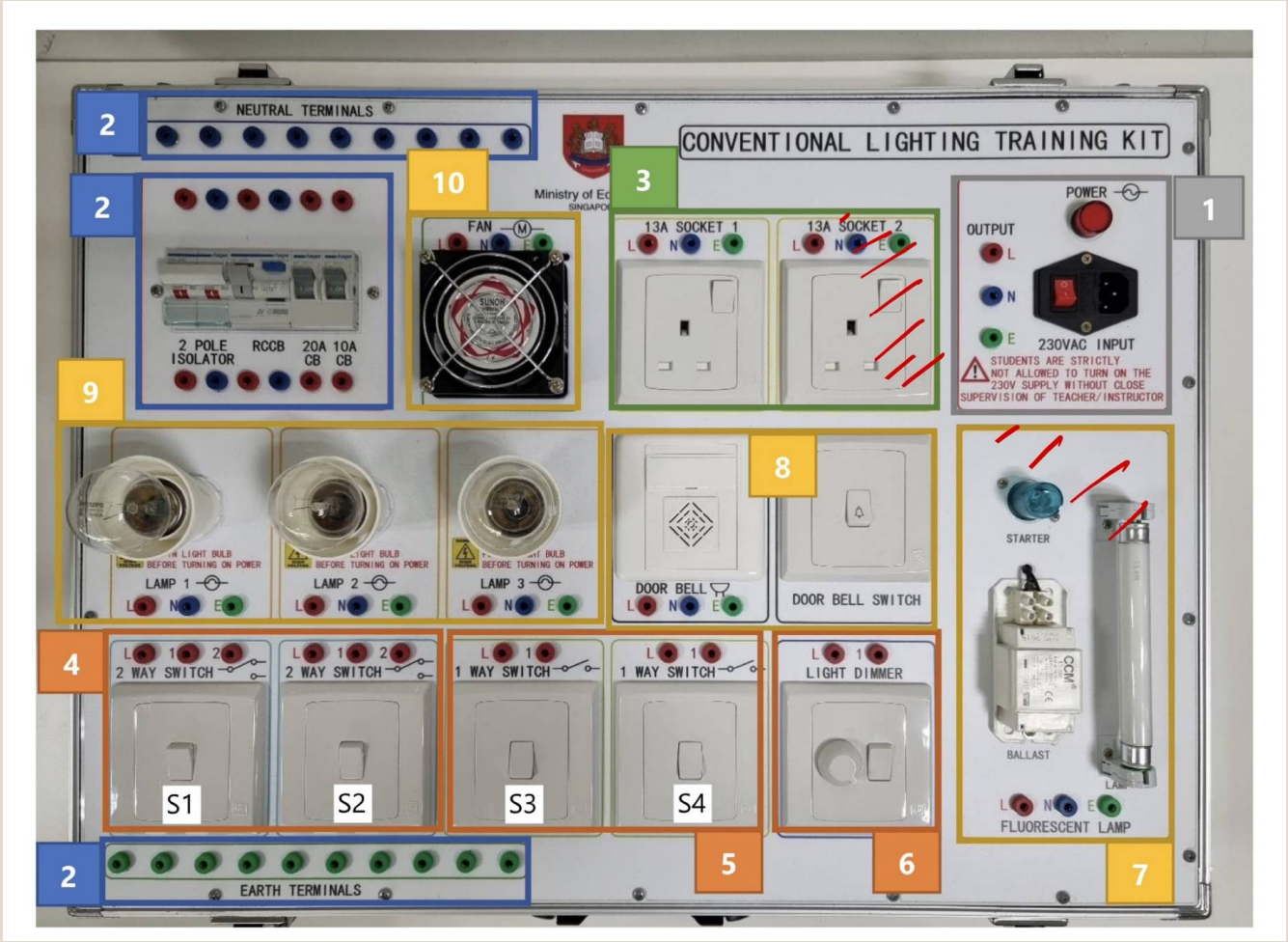


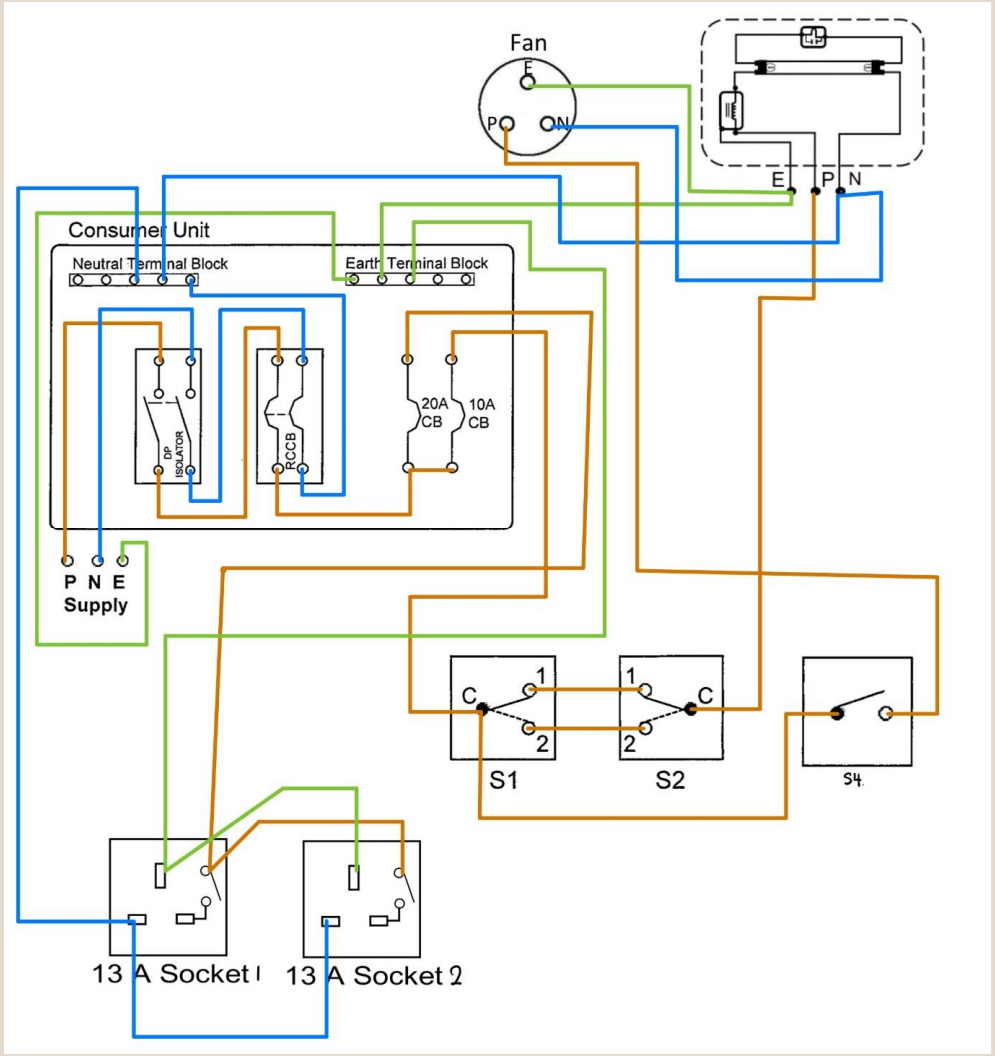
- Home Automation Basics, Wireless Networks and radio frequency, Installing and Programming Devices.
- Installing relevant mobile apps, Control of electrical and security equipment/systems via mobile phone.

How is SET assessed?

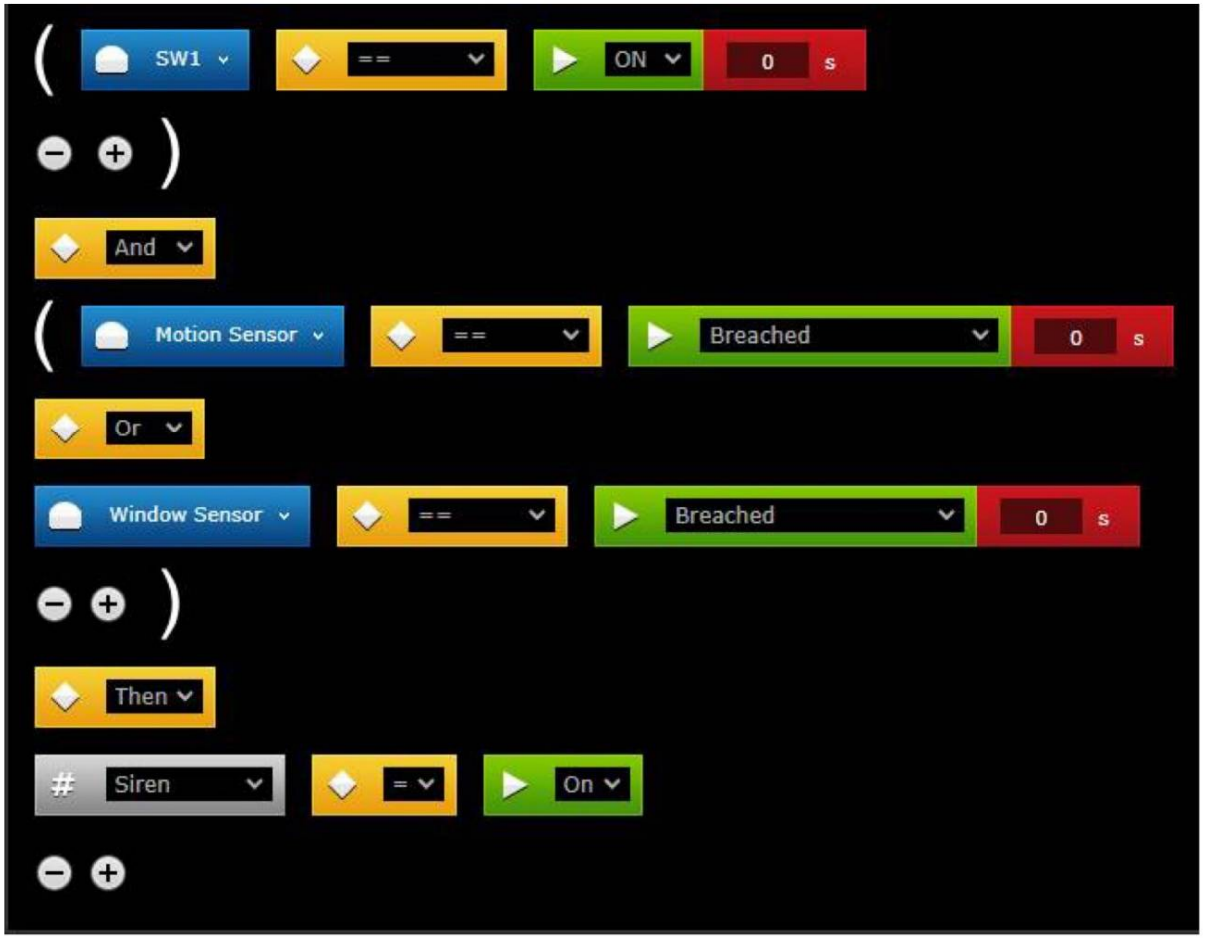
Paper	Mode	Weighting	Time
1	Written (30 MCQs)	30 %	Oct - Sec 4
2	Practical – 1 hr 20 mins (Electrical Principles and Conventional Lighting)	30 %	Sep - Sec 4
3	Practical – 1 hr 30 mins (Home Automation)	40 %	Sep - Sec 4

- Scheduled within the GCE N-Level Examination Timetable


CONVENTIONAL LIGHTING TRAINING KIT
NEUTRAL TERMINALS
EARTH TERMINALS
2 POLE ISOLATOR
RCCB
20A CB
10A CB
FAN
13A SOCKET 1
13A SOCKET 2
POWER
OUTPUT
230VAC INPUT
STUDENTS ARE STRICTLY NOT ALLOWED TO TURN ON THE 230V SUPPLY WITHOUT CLOSE SUPERVISION OF TEACHER/INSTRUCTOR
LAMP 1
LAMP 2
LAMP 3
DOOR BELL
DOOR BELL SWITCH
2 WAY SWITCH
2 WAY SWITCH
1 WAY SWITCH
1 WAY SWITCH
LIGHT DIMMER
S1
S2
S3
S4
STARTER
BALLAST
FLUORESCENT LAMP
1
2
3
4
5
6
7
8
9
10


Fan
E
P
N
E
P
N
Consumer Unit
Neutral Terminal Block
Earth Terminal Block
DP ISOLATOR
RCCB
20A CB
10A CB
P N E
Supply
C
1
2
S1
1
C
2
S2
S4
13 A Socket 1
13 A Socket 2

Scene 1 (CHECKED)



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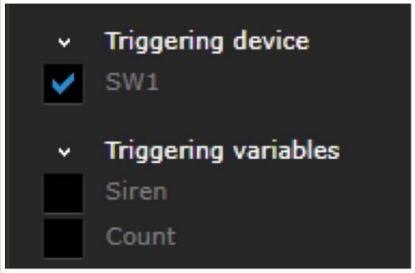

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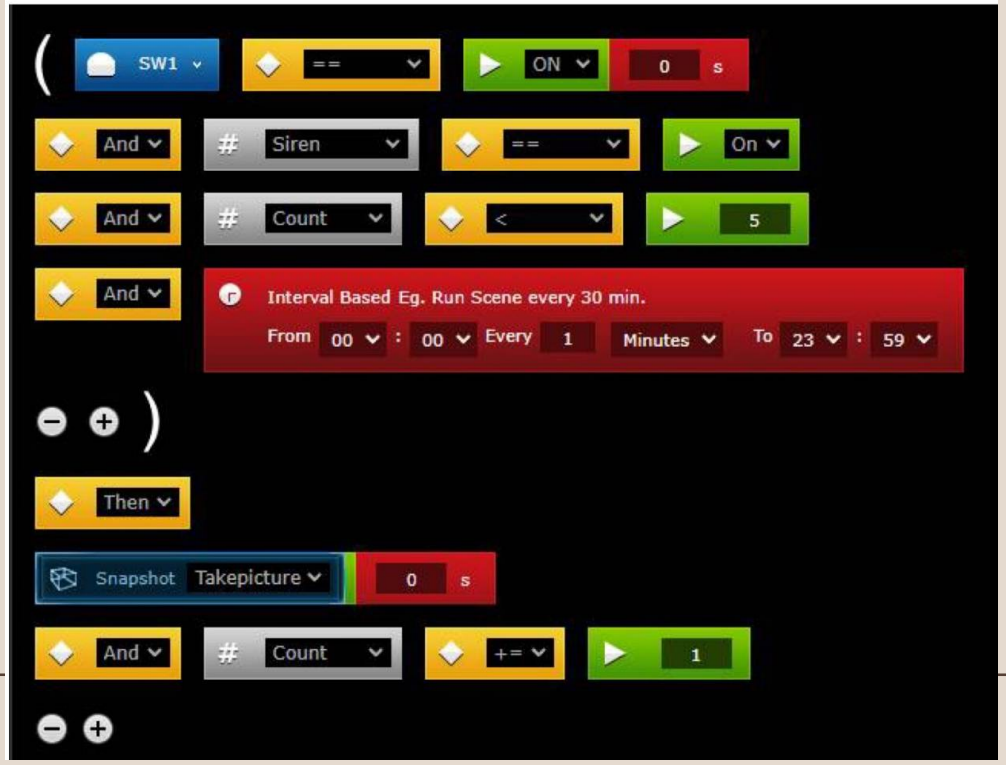

Thank You