

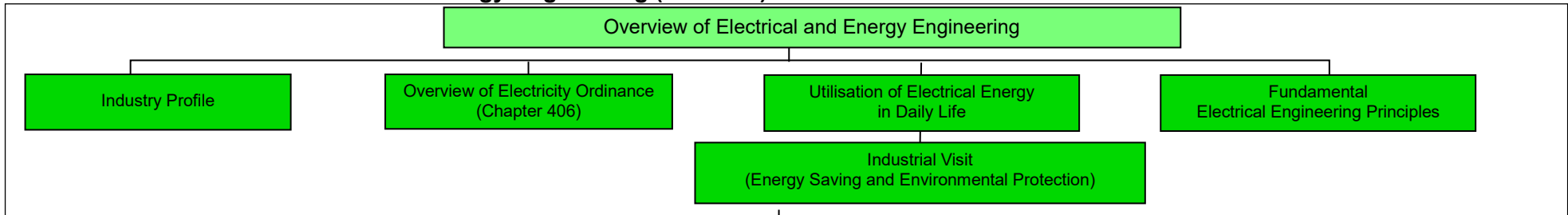
## Applied Learning

### 2023-25 Cohort; 2025 HKDSE

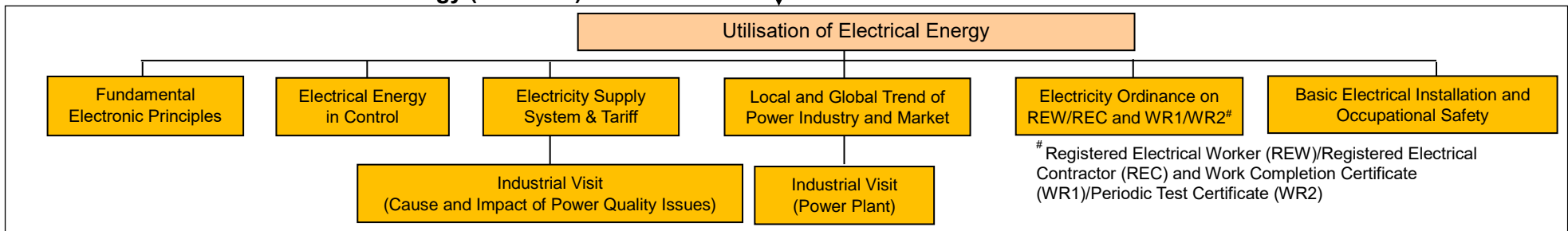
Item	Description
1. Course Title	Electrical and Energy Engineering
2. Course Provider	Vocational Training Council
3. Area of Studies/ Course Cluster	Engineering and Production/ Civil, Electrical and Mechanical Engineering
4. Medium of Instruction	Chinese or English
5. Learning Outcomes	<p>Upon completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>(1) analyse the general profile of the electrical and energy engineering industry, and its latest development;</li> <li>(2) apply the basic principles and techniques of electrical engineering, in particular the knowledge of energy efficiency enhancement to formulate engineering solutions;</li> <li>(3) integrate knowledge and skills in electrical and energy engineering industry, including work ethics and social responsibilities, occupational safety and sustainable development, as well as communication and problem-solving skills;</li> <li>(4) interpret the latest development and achievements in the related engineering fields;</li> <li>(5) demonstrate positive values and attitudes towards the electrical and energy engineering industry; and</li> <li>(6) develop self-understanding for further studies and career development in the related field.</li> </ol>

6. Curriculum Map – Organisation and Structure

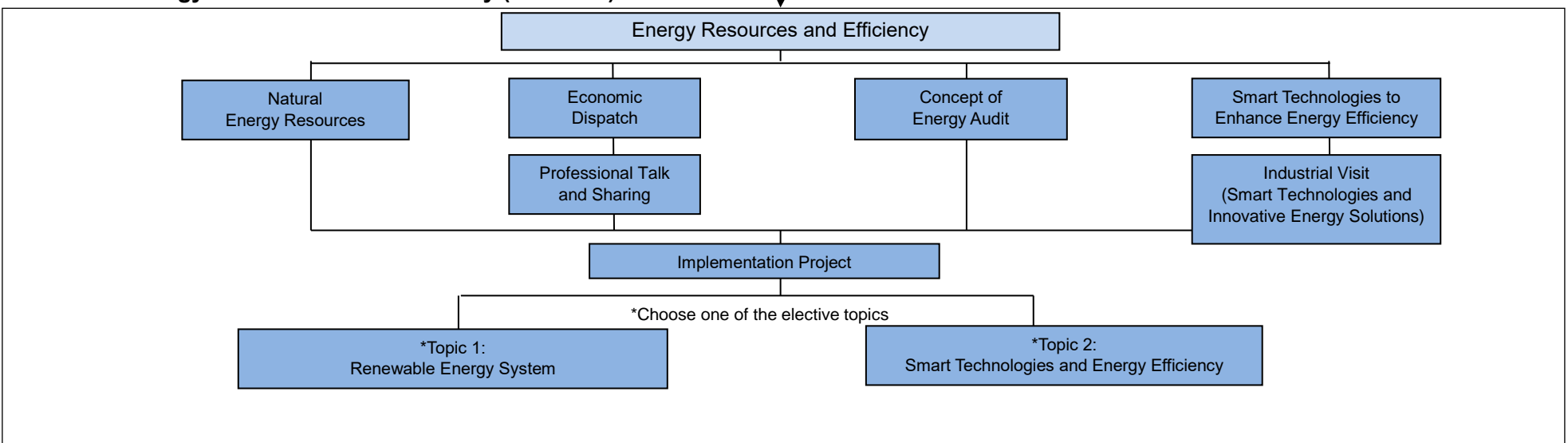
**Module 1: Overview of Electrical and Energy Engineering (36 hours)**



**Module 2: Utilisation of Electrical Energy (72 hours)**



**Module 3: Energy Resources and Efficiency (72 hours)**



## 7. The Context

- The information on possible further study and career pathways is provided to enhance students' understanding of the wider context of the specific Applied Learning course. Students who have successfully completed Applied Learning courses have to meet other entry requirements as specified by the institutions.
- The recognition of Applied Learning courses for admission to further studies and career opportunities is at the discretion of relevant institutions.

### Possible further study and career pathways

#### Further studies

- e.g. electrical engineering, electronics engineering, building services engineering, mechanical engineering, environmental protection and management, environmental engineering and energy management

#### Career development

- e.g. **positions at entry level** (e.g. craft apprentice, technician apprentice, technical assistant, technician trainee, technical officer trainee, technician, technical officer, works supervisor, assistant inspector) and **positions at managerial level** (e.g. engineer, project engineer, project co-ordinator, chief technical officer, chief inspector, project manager)

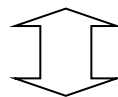
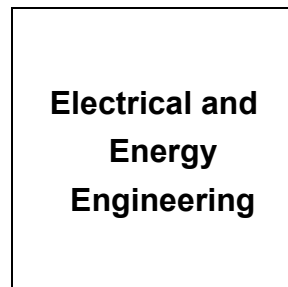
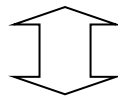
### Relations with core subjects and other elective subjects

#### Enhancing and enriching, e.g.

- enhancing the depth and breadth of studies in **Physics** (such as knowledge of electrical principles, electricity and motion, energy, energy efficiency and science principles) and **Design and Applied Technology** (such as knowledge of systems and control) through applying the knowledge of electrical and energy engineering

#### Expanding horizons, e.g.

- students taking **Humanities subjects** may broaden their knowledge in electrical and energy engineering



### Relations with other areas of studies/ courses of Applied Learning

e.g.

#### **Business, Management and Law**

- the knowledge and skills of project management and problem-solving skills can enhance the learning in the area of **Business, Management and Law**

#### **Creative Studies**

- the knowledge and skills of the control design and smart technology in energy management can reinforce the learning of design principles in the area of **Creative Studies**

### Foundation knowledge developed in junior secondary education

The course is built upon the foundation knowledge students acquired in, e.g.

- **Technology Education** – energy and energy resources
- **Science Education** – electricity and magnetism
- **Mathematics Education** – data handling
- **Chinese Language Education and English Language Education** – verbal and written communication

## **Applied Learning**

### **2023-25 Cohort; 2025 HKDSE**

#### **Learning and Teaching**

**Course Title** : **Electrical and Energy Engineering**  
**Area of Studies** : **Engineering and Production**  
**Course Provider** : **Vocational Training Council**

In Electrical and Energy Engineering, student-centred learning and teaching activities are designed to enable students to understand fundamental theories and concepts, develop their generic skills, and address their career aspirations in the electrical and energy engineering industry.

Different modes of activities are employed to provide students with a systematic understanding about the context (e.g. lectures on the overview of the electrical and energy engineering industry, basic electrical engineering and electronic principles and techniques) and eye-opening opportunities to experience the complexity of the context (e.g. visits to a power plant, organisations related to energy saving and environmental protection, smart technologies and innovative energy, and sharing by industry practitioners).

Students acquire an understanding of the requirements, fundamental knowledge and skills essential for further learning within the area through learning-by-practising opportunities in an authentic or near-authentic environment (e.g. experiments on electrical engineering principles, and using the tools/instrument in electronic and electrical workshop practices).

Students are also encouraged to develop and apply conceptual, practical and reflective skills to demonstrate entrepreneurship and innovation. Students are given opportunities to integrate the knowledge and skills acquired and consolidate their learning (e.g. group discussion to evaluate the social and environmental impacts on the different fuel mix strategies for electricity generation. In the implementation project, students prepare a proposal on renewable energy system or smart technology and energy efficiency. They integrate and apply the knowledge and techniques acquired in the course, transform their design ideas of utilising renewable energy, or to enhance the efficiency of an electrical system into the production of a prototype and a project report. Apart from the subject knowledge and technical skills, students demonstrate analytical skills and critical thinking skills through completing the project. They also practise self-management and collaborative skills during the process of project management).

## Applied Learning

### 2023-25 Cohort; 2025 HKDSE

## Curriculum Pillars of Applied Learning in Context – Electrical and Energy Engineering

Through the specific contexts related to the course, students have different learning opportunities, for example:

### 1. Career-related Competencies

- understand the importance of abiding by ethical, social and legal requirements as well as work ethics and responsibilities;
- demonstrate the knowledge and skills in electrical and energy engineering, including basic electrical and electronics principles, design and operation of sensing and control circuits for lighting and motor, and operating principles of electrical power generation, power transmission and distribution, energy efficiency, energy audit, renewable energy and sustainability;
- apply engineering knowledge and skills to plan and design solutions for practical problems in electrical and energy engineering;
- appreciate the phases of managing engineering projects;
- demonstrate the ability to work effectively in a project team and finesse the communication skills in handling tasks of renewable energy or smart technology to enhance energy efficiency; and
- explore the aptitudes and abilities required in electrical and energy engineering industry, and develop a personal roadmap to articulate to different levels of qualifications.

### 2. Foundation Skills

- practise communication skills through group discussions, project reports and presentations, experiments and critique;
- demonstrate information technology skills for electrical and energy engineering applications with the use of different computer tools and software (e.g. computer application for lighting design and printed circuit board design); and
- apply mathematical skills when analysing data (e.g. experimental data of electrical engineering principles).

### 3. Thinking Skills

- practise problem-solving skills, decision-making skills, creative thinking skills and analytical skills when planning, developing and evaluating engineering project work;
- analyse the effectiveness of different alternatives for engineering solutions (e.g. the different illumination technologies, and the various fuel mix strategies for electricity generation); and
- form regional/global perspectives on social, economic and technological changes essential to the utilisation and generation of electricity, as well as the concern about energy conservation and sustainability.

**4. People Skills**

- demonstrate self-reflection skills through feedback from tutors and classmates in various learning activities such as class exercises, experiments, mini-project, group discussions, presentations and critique;
- practise self-management skills during preparation for tests and presentation; and
- demonstrate interpersonal, collaborative and team building skills through interacting actively with tutors and classmates in lectures, brainstorming, group discussions, presentation, experiments and project.

**5. Values and Attitudes**

- demonstrate respect for others, social responsibility, law and authority through discussing electricity ordinance, professional ethics and environmental issues, especially in the planning of the project;
- discuss positive attitude towards green living and the importance of low carbon emission in topics, such as energy labelling scheme, energy resources, energy saving, energy conservation and sustainability; and
- demonstrate positive attitudes (e.g. enthusiasm and motivation, and willingness to learn) through various learning activities, e.g. practical training, mini-project and group discussions.