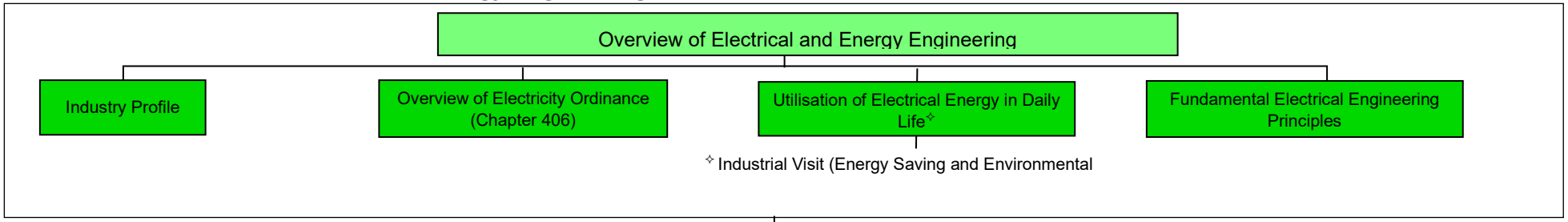
Applied Learning

2026-28 Cohort; 2028 HKDSE

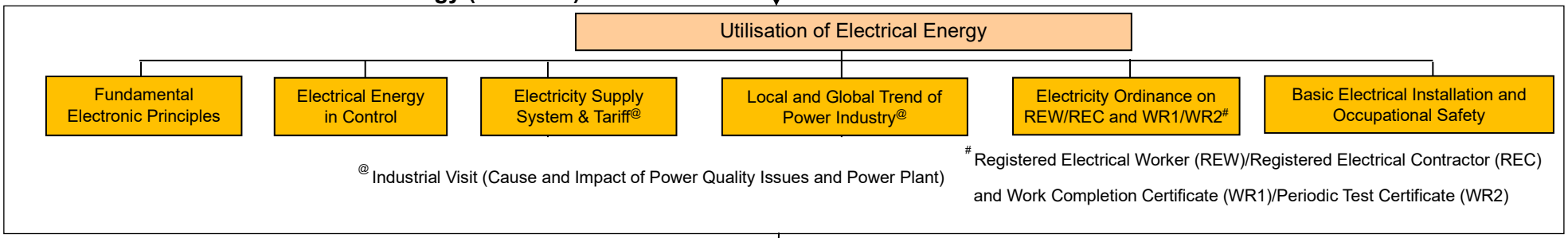
Item	Description
1. Course Title	Electrical and Energy Engineering
2. Course Provider	Vocational Training Council
3. Area of Studies/ Course Cluster	Engineering and Production/ Civil, Electrical and Mechanical Engineering
4. Medium of Instruction	Chinese or English
5. Learning Outcomes	Upon completion of the course, students should be able to: (i) analyse the general profile of the electrical and energy engineering industry, and its latest development; (ii) apply the basic principles and techniques of electrical engineering, in particular the knowledge of energy efficiency enhancement to formulate engineering solutions; (iii) 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; (iv) illustrate the latest development and achievements in the related engineering fields; (v) demonstrate proper values and attitudes towards the electrical and energy engineering industry; and (vi) enhance self-understanding and explore directions on further studies and career pursuits.

6. Curriculum Map – Organisation and Structure

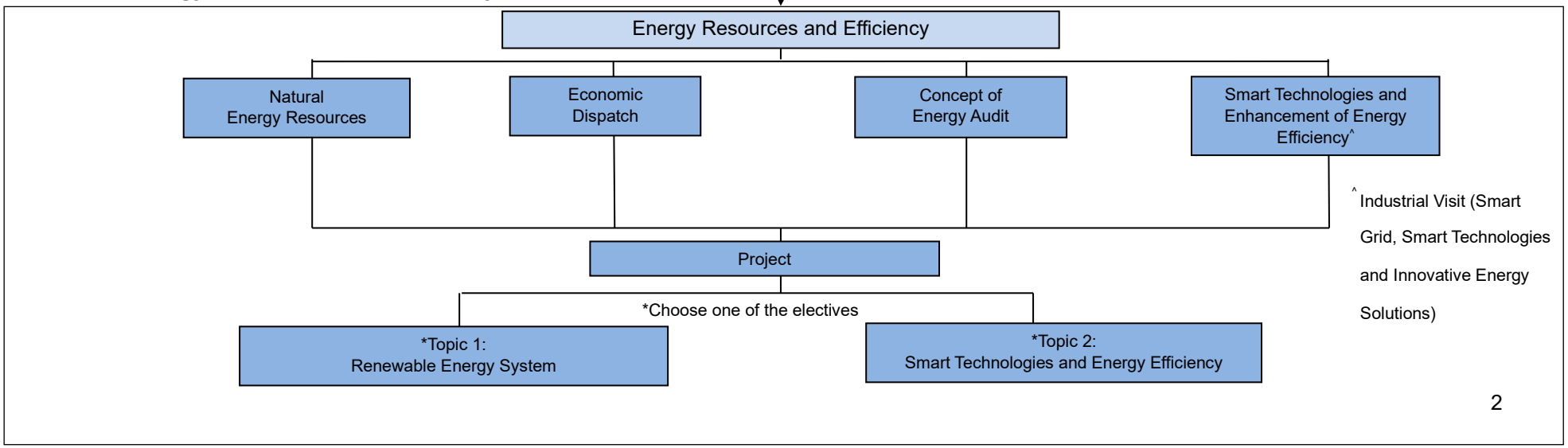
Module 1: Overview of Electrical and Energy Engineering (36 hours)



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.
- The recognition of Applied Learning courses for admission to further studies and career opportunities is at the discretion of relevant institutions. Students who have successfully completed Applied Learning courses have to meet other entry requirements as specified by the institutions.

Possible further study and career pathways

Further studies

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

Career development

- e.g. craft apprentice, technician apprentice, technical assistant, technical officer trainee, technician, technical officer, works supervisor, assistant works inspector

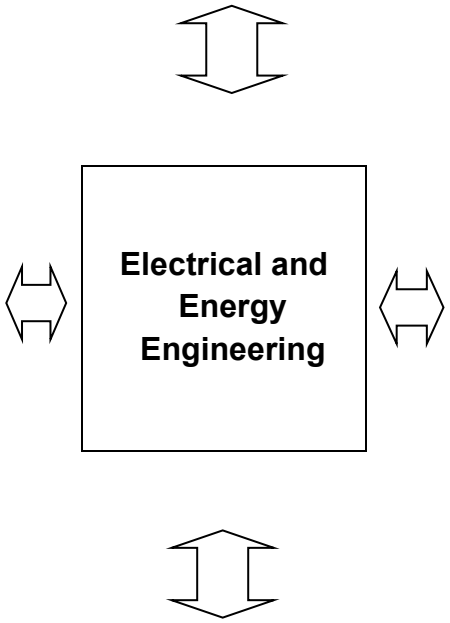
Complementarity with core subjects and other elective subjects

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 **Geography** may broaden their knowledge in electrical and energy engineering



Relations with other Areas of Studies/ courses of Applied Learning

e.g.

Creative Studies

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

Business, Management and Law

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

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 skills

8. Learning and Teaching

In this course, 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 and electronic engineering 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 and instrument in electronic and electrical workshop practices).

Students are given opportunities to consolidate their learning and demonstrate entrepreneurship and innovation (e.g. group discussion to evaluate the social and environmental impacts on the different fuel mix strategies for electricity generation. In the 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 application of course knowledge and skills, students demonstrate analytical skills and critical thinking skills through the project. They also practise self-management and collaborative skills during the process of project management).

9. Curriculum Pillars of Applied Learning

Through related contexts, students have different learning opportunities, for example:

(i) 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 light sensors and control circuits for motor, and operating principles of 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;
- understand the phases of managing engineering projects;
- demonstrate effective team work and communication skills in handling tasks related to renewable energy or smart technology, and 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.

(ii) Foundation Skills

- demonstrate 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 tools and software (e.g. printed circuit board design); and
- apply mathematical skills when analysing data (e.g. experimental data of electrical engineering principles).

(iii) Thinking Skills

- demonstrate problem-solving skills, decision-making skills, creative thinking skills and analytical skills when planning, implementing 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.

(iv) 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;
- demonstrate self-management skills during preparation for assessment tasks and presentation; and
- demonstrate interpersonal, collaborative and team building skills through interacting actively with tutors and classmates in lectures (e.g. brainstorming, group discussions, presentation, experiments and the project).

(v) Values and Attitudes

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