Applied Learning (Senior Secondary Level)

2016-18 Cohort

Learning and Teaching

Subject Title   :   **Building Technology**
Area of Studies   :   **Engineering and Production**
Course Provider   :   **Vocational Training Council**

In Building Technology, 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 building 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 building industry, and basic architectural and engineering principles and techniques) and eye-opening opportunities to experience the complexity of the context (e.g. visits to public, residential or commercial buildings 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. use of computer systems in preparing building drawings or conduct experiments on mechanical and electrical systems).

Students are also encouraged to develop and apply conceptual, practical and reflective skills to demonstrate innovation and entrepreneurship (e.g. group project to evaluate the role of engineers in striking a balance between enhancing quality of life and environmental conservations and propose strategies to promote the development of both).   Students are given opportunities to integrate the knowledge and skills acquired and consolidate their learning (e.g. in the implementation project, students prepare a proposal on spatial design or computer control of facilities.   Students integrate and apply the knowledge and techniques acquired in the course, transform spatial design ideas to architectural presentations such as architectural drawings and a model, or transform ideas on computer control of building facilities and energy management technology to the production of prototype and a project report.   Students demonstrate analytical skills and critical thinking skills through evaluating engineering solutions and generating recommendations.   They also practice self-management and collaborative skills during the process of project management).

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Curriculum Pillars of Applied Learning in Context – Building Technology

Upon completion of the subject, students should be able to:
- analyse the general profile of the building industry, and its latest local and global development;
- apply the basic principles and techniques of architectural design and building facilities management to formulate engineering solutions;
- conduct the implementation project with consideration to work ethics and responsibilities, safety as well as sustainable development, integrating knowledge and skills in building industry, creative thinking, communication skills and problem-solving skills;
- appreciate the latest development and achievements in engineering in related fields;
- appreciate the importance of work ethics and demonstrate positive values and attitudes in the building industry; and
- develop self-understanding for further studies and career development in the related field.

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

1. **Career-related Competencies**
   - discuss the importance of abiding by ethical, social and legal requirements as well as work ethics and responsibilities;
   - demonstrate the knowledge and skills in building design process and spatial design, and operating principles of various electrical and mechanical systems used in buildings and the latest computer control and energy saving technologies to provide occupants with a comfortable, healthy and safe environment;
   - describe the phases of managing engineering projects;
   - apply engineering knowledge and skills to plan and design solutions for practical problems in building design and operations;
   - demonstrate the ability to work effectively in a project team and communication skills in handling tasks of architectural design and building facilities management; and
   - discuss the aptitudes and abilities required in the building industry and develop a personal roadmap to articulate to different levels of qualifications.

2. **Foundation Skills**
   - practise communication skills through role play, group discussions, project presentations, construction drawings, experiments and critique;
   - demonstrate information technology skills for building engineering applications with the use of different computer tools and software (e.g. computer application for construction drawing and programming for building automation); and
   - apply numeracy skills when analysing data (e.g. scaling of drawings or physical models, experimental data of indoor air quality and energy consumption).

3. **<u>Thinking Skills</u>**
-   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. logical spatial design scheme, energy saving approaches and technologies);
-   form regional/global perspectives on social, economic and technological changes essential to the engineering applications in architectural design and building facilities management; and
-   demonstrate an understanding of the interdependency and relationships between different societies and civilisations, through identifying the need of the end-users and its effects on the design of buildings, as well as its operation and management of building facilities .

4. **<u>People Skills</u>**
-   demonstrate self-reflection skills through feedback from tutors and classmates in various learning activities such as class exercises, experiments, construction drawing, model making, group discussions, presentations and critique;
-   practise self-management skills during preparation for tests and project presentation; and
-   demonstrate interpersonal, collaborative and team building skills through interacting actively with tutors and classmates in lectures, brainstorming, group discussions, presentation, experiments, model making and the implementation project.

5. **<u>Values & Attitudes</u>**
-   demonstrate respect for others, social responsibility and law through discussing professional ethics and environmental issues, especially in the planning of the implementation project;
-   discuss positive attitude towards green living and the importance of low carbon emission in topics related to sustainable development and energy saving in building environment; and
-   demonstrate positive attitudes (e.g. enthusiasm and motivation, and willingness to learn) through various learning activities, e.g. hands-on applications and group discussions.