

## Subject Description Form

<b>Subject Code</b>	EE2103 / EE2103B/ IC2113
<b>Subject Title</b>	IC Training I (TSE)
<b>Credit Value</b>	4 Training Credits
<b>Level</b>	2
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	<ol style="list-style-type: none"> <li>1. To provide trainees with simulated working environments and training of industrial practices.</li> <li>2. This subject covers a wide range of fundamental electrical engineering application technology that including electrical installation practice, lighting and electrical system design, LV switchboard and power monitoring, integral building system and basic electronic practice.</li> <li>3. To provide the students with knowledge of principles and techniques in some site practices to enable them to appreciate the builder's work associated with pavement and highway construction.</li> </ol>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. identify relevant engineering theories and principles and to apply them in hands-on training exercises to determine system feasibility;</li> <li>b. compare and contrast conceptual design, develop actual work sequences and methods for various electrical installations;</li> <li>c. recognize the engineering standards, regulations and practices to undertake the design, construction, testing and commissioning electrical distribution and control system in buildings ;</li> <li>d. identify good practices and workmanship in structural concrete &amp; steelwork; describe actual work sequences and methods in area of structural concrete &amp; steelwork; explain the technology impact on equipment, materials and work methods to keep abreast of technology development and construction engineering practices in association with highway construction; and</li> <li>e. identify and relate relevant fundamental engineering theories and principles of site formation and anchorage practice to extend their knowledge and understanding in pavement construction and in highway construction;</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><u>(TM0367) Lighting and Electrical System Design</u> Interior lighting design and calculation; daylight illumination consideration; lumens and reflectors; T5, T8 and T11 lamps; energy conservation. Introduction of low-voltage power distribution system and code of practices of electrical design in Hong Kong; examine architectural drawings; design lighting and electrical services; prepare layout drawings and schematics.</p> <p><u>(TM0372) Electrical Installation, Basic Automation and Electronic Practice</u> Wiring for conventional low voltage installations and intelligent building control systems (EIB and DALI); final lighting and power circuits, control gears and protective devices; inspection, testing. Introduction of programmable controller systems, sensors, actuators, drives, timers, counters, ladder logic programming and testing. Identification of electronic circuit components, soldering and de-soldering, Dry film process, Etching process.</p>

(TM1245) Structural Concrete and Steelwork for EE TSE (DG)

- Structural Concrete

Recognize concrete types and materials; perform concrete mixing, placing, compaction and site quality control tests works; Understand Reinforcement types, sizes, detailing, cutting, bending and fixing steel bars in a timber formwork; Detect cover and size of steel bars in reinforced concrete structures. Design and construction of a simple precast concrete element.

- Structural Steelwork

Recognize common structural steel sections used in construction industry; steelwork properties, cutting, drilling of steelwork members; understand connection methods of steel members. Use of steelwork and associated practical problems in temporary work; corrosion protection of steelwork.

(TM1244) Formwork, Scaffolding, Underground Utility Survey and Anchoring for TSE

- Formwork and Scaffolding (15 hrs)

- Introduction to types of forms, materials; tools and equipment.
- Simple formwork design.
- Fabrication of timber formwork.
- Introduction to types of metal scaffolding and falsework, materials; tools and equipment; scaffolding safety.
- Erection of simple scaffolding.

- Underground Utility Survey (7.5 hrs)

- Ground Penetration Radar Survey
- CCTV Survey in underground pipe systems
- Cable Locator Survey

- Anchoring Technology Practice (7.5 hrs)

- Fixing and anchoring systems commonly used in highway projects, e.g. mechanical and chemical anchor bolts and anchor strength tester.

**Teaching/ Learning Methodology**

The teaching and learning methods include lectures, workshop tutorials, and practical works to convey general principles, techniques and related technologies to students. Their learning knowledge will be strengthened through the practical exercises and case studies in a problem-based format for the development of system integration skills, and to effectively apply those on real world environments.

**Assessment Methods in Alignment with Intended Learning Outcomes**

Assessment Methods	% weighting	Intended Learning Outcomes Assessed				
		a	b	c	d	e
(TM0367) Lighting and Electrical System Design (TM0372) Electrical Installation, Basic Automation and Electronic Practice						
1. Assignments	40%	✓	✓	✓		
2. Test	30%	✓	✓			
3. Report	30%	✓	✓	✓		
Total	100%					

Assessment Methods	% weighting	Intended Learning Outcomes Assessed				
		a	b	c	d	e
(TM1245) Structural Concrete and Steelwork for EE TSE (DG)						
1. Test	30%				✓	
2. Report	70%				✓	
Total	100%					

  

Assessment Methods	% weighting	Intended Learning Outcomes Assessed				
		a	b	c	d	e
(TM1244) Formwork, Scaffolding, Underground Utility Survey and Anchoring for TSE						
1. Assignments	30%					✓
2. Test	30%					✓
3. Report	40%					✓
Total	100%					

Assignment is designed to facilitate students to reflect and apply the knowledge periodically throughout the training.

Test is designed to facilitate students to review the breadth and depth of their understanding on specific topics.

Report is designed to facilitate students to acquire deep understanding on the topics of the training and to present those concepts clearly.

<b>Student Study Effort Expected</b>	<b>Class Contact</b>	
	▪ Workshop / In-Class Practice	120 Hrs.
	<b>Other Study Effort</b>	<b>0 Hrs.</b>
	<b>Total Study Effort</b>	<b>120 Hrs.</b>

<b>Reading List and References</b>	<ol style="list-style-type: none"> <li>1. Training materials, manual and articles published by the Industrial Centre.</li> <li>2. EMSD, Code of Practice for the Electricity (Wiring) regulations, 2020 Edition</li> <li>3. IET wiring regulation, 18th Edition.</li> <li>4. BS1377-1 (2016), "Methods of Test for Soils for Civil Engineering Purposes. General requirements and sample preparation", BSI</li> <li>5. Wong &amp; Allen (2009). "The Hong Kong Conduit Condition Evaluation Codes". Utility Training Institution (UTI), Hong Kong, China.</li> <li>6. Hilti Corporation (2021), "Anchor fastening technology manual", Hilti (www.hilti.com).</li> </ol>
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