

Subject Description Form

Subject Code	EE2103B/IC2113
Subject Title	IC Training I (TSE)
Credit Value	4 Training Credits
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<ol style="list-style-type: none"> 1) To provide trainees with simulated working environments and training of industrial practices. 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. 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.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a) identify relevant engineering theories and principles and to apply them in hands-on training exercises to determine system feasibility; b) compare and contrast conceptual design, develop actual work sequences and methods for various electrical installations; c) recognize the engineering standards, regulations and practices to undertake the design, construction, testing and commissioning electrical distribution and control system in buildings ; d) identify good practices and workmanship in structural concrete & steelwork; describe actual work sequences and methods in area of structural concrete & 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 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;
Subject Synopsis/ Indicative Syllabus	<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.</p>

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.

(TM0372) Electrical Installation, Basic Automation and Electronic Practice

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.

(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.

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	<table border="1" data-bbox="480 439 1474 1641"> <thead> <tr> <th data-bbox="480 439 916 613">Assessment Methods</th> <th data-bbox="916 439 1086 837" rowspan="2">Weighting (%)</th> <th colspan="5" data-bbox="1086 439 1474 546">Intended Learning Outcomes Assessed</th> </tr> <tr> <th data-bbox="480 613 916 837"></th> <th data-bbox="1086 546 1161 837">a</th> <th data-bbox="1161 546 1236 837">b</th> <th data-bbox="1236 546 1311 837">c</th> <th data-bbox="1311 546 1386 837">d</th> <th data-bbox="1386 546 1474 837">e</th> </tr> </thead> <tbody> <tr> <td data-bbox="480 613 916 837">(TM0367) Lighting and Electrical System Design (TM0372) Electrical Installation, Basic Automation and Electronic Practice</td> <td data-bbox="916 613 1086 837"></td> <td data-bbox="1086 546 1161 837"></td> <td data-bbox="1161 546 1236 837"></td> <td data-bbox="1236 546 1311 837"></td> <td data-bbox="1311 546 1386 837"></td> <td data-bbox="1386 546 1474 837"></td> </tr> <tr> <td data-bbox="480 837 916 904">1. Assignment</td> <td data-bbox="916 837 1086 904">40</td> <td data-bbox="1086 837 1161 904">✓</td> <td data-bbox="1161 837 1236 904">✓</td> <td data-bbox="1236 837 1311 904">✓</td> <td data-bbox="1311 837 1386 904"></td> <td data-bbox="1386 837 1474 904"></td> </tr> <tr> <td data-bbox="480 904 916 972">2. Test</td> <td data-bbox="916 904 1086 972">30</td> <td data-bbox="1086 904 1161 972">✓</td> <td data-bbox="1161 904 1236 972">✓</td> <td data-bbox="1236 904 1311 972"></td> <td data-bbox="1311 904 1386 972"></td> <td data-bbox="1386 904 1474 972"></td> </tr> <tr> <td data-bbox="480 972 916 1039">3. Report</td> <td data-bbox="916 972 1086 1039">30</td> <td data-bbox="1086 972 1161 1039">✓</td> <td data-bbox="1161 972 1236 1039">✓</td> <td data-bbox="1236 972 1311 1039">✓</td> <td data-bbox="1311 972 1386 1039"></td> <td data-bbox="1386 972 1474 1039"></td> </tr> <tr> <td data-bbox="480 1039 916 1106">Total</td> <td data-bbox="916 1039 1086 1106">100</td> <td colspan="5" data-bbox="1086 1039 1474 1106"></td> </tr> <tr> <th data-bbox="480 1122 916 1296">Assessment Methods</th> <th data-bbox="916 1122 1086 1431" rowspan="2">Weighting (%)</th> <th colspan="5" data-bbox="1086 1122 1474 1229">Intended Learning Outcomes Assessed</th> </tr> <tr> <th data-bbox="480 1296 916 1431"></th> <th data-bbox="1086 1229 1161 1431">a</th> <th data-bbox="1161 1229 1236 1431">b</th> <th data-bbox="1236 1229 1311 1431">c</th> <th data-bbox="1311 1229 1386 1431">d</th> <th data-bbox="1386 1229 1474 1431">e</th> </tr> <tr> <td data-bbox="480 1296 916 1431">(TM1245) Structural Concrete and Steelwork for EE TSE (DG)</td> <td data-bbox="916 1296 1086 1431"></td> <td data-bbox="1086 1229 1161 1431"></td> <td data-bbox="1161 1229 1236 1431"></td> <td data-bbox="1236 1229 1311 1431"></td> <td data-bbox="1311 1229 1386 1431"></td> <td data-bbox="1386 1229 1474 1431"></td> </tr> <tr> <td data-bbox="480 1431 916 1498">1. Test</td> <td data-bbox="916 1431 1086 1498">30</td> <td data-bbox="1086 1431 1161 1498"></td> <td data-bbox="1161 1431 1236 1498"></td> <td data-bbox="1236 1431 1311 1498"></td> <td data-bbox="1311 1431 1386 1498">✓</td> <td data-bbox="1386 1431 1474 1498"></td> </tr> <tr> <td data-bbox="480 1498 916 1565">2. Report</td> <td data-bbox="916 1498 1086 1565">70</td> <td data-bbox="1086 1498 1161 1565"></td> <td data-bbox="1161 1498 1236 1565"></td> <td data-bbox="1236 1498 1311 1565"></td> <td data-bbox="1311 1498 1386 1565">✓</td> <td data-bbox="1386 1498 1474 1565"></td> </tr> <tr> <td data-bbox="480 1565 916 1641">Total</td> <td data-bbox="916 1565 1086 1641">100</td> <td colspan="5" data-bbox="1086 1565 1474 1641"></td> </tr> </tbody> </table>						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. Assignment	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					
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	2. Test	30					✓
	3. Report	40					✓
	Total	100					
	<p>Assignment is designed to facilitate students to reflect and apply the knowledge periodically throughout the training.</p> <p>Test is designed to facilitate students to review the breadth and depth of their understanding on specific topics.</p> <p>Report is designed to facilitate students to acquire deep understanding on the topics of the training and to present those concepts clearly.</p>						
Student Study Effort Required	Class Contact						
	▪ Workshop / In-Class Practice					120 Hrs.	
	Other Study Effort					0 Hrs.	
	Total Study Effort					120 Hrs.	
Reading List and References	<ol style="list-style-type: none"> 1. Training materials, manual and articles published by the Industrial Centre. 2. EMSD, Code of Practice for the Electricity (Wiring) regulations, 2015 Edition. 3. IET wiring regulation, 18th Edition. 4. BS1377 (1990), “Methods of Test for Soils for Civil Engineering Purposes. General requirements and sample preparation”, BSI 5. Wong & Allen (2009). “The Hong Kong Conduit Condition Evaluation Codes”. Utility Training Institution (UTI), Hong Kong, China. 6. Hilti Corporation (2009), “Anchor fastening technology manual”, Hilti (www.hilti.com). 						