

**THE HONG KONG INSTITUTION OF ENGINEERS**  
**SCHEME “A” GRADUATE TRAINING**  
**CONSOLIDATED MODEL TRAINING GUIDE**  
**ELECTRONICS ENGINEERING**

| Location where Training will be done | Training Outcomes   | Previous Reference  | HKIE Competence Ref.                         | Length of Time (weeks) |
|--------------------------------------|---|---|--|------------------------|
|                                      | <b>1. Introduction</b>  |   |  | <b>1</b>               |
|                                      | 1.1 Information about the Company   |   |  |                        |
| <i>Location 1</i>                    | <i>Description 1</i>  |   |  |                        |
|                                      | 1.1.1 Own Organisation <ul style="list-style-type: none"> <li>a) Discuss the size, history and internal culture of the trainee’s own organisation.</li> <li>b) Discuss an overview of the relationship between the trainee’s own organisation, government departments and other organisations.</li> <li>c) Discuss the structure and functions of different units within the trainee’s own organisation.</li> <li>d) Demonstrate the awareness to follow operational procedures and practices as required by the trainee’s own organisation.</li> <li>e) Discuss the objectives, requirements and processes that support the quality assurance system within the trainee’s own organisation.</li> <li>f) Apply the quality assurance system according to the policy of the trainee’s own organisation.</li> </ul> | CCO<br>1.10<br><br>CCO<br>1.10<br><br>CCO<br>1.10<br><br>CCO<br>1.10<br><br>CCO<br>1.10 | 11<br><br><br><br><br><br><br><br><br><br>11 |                        |
|                                      | 1.1.2 Training Programme, Prospects and Career Development <ul style="list-style-type: none"> <li>a) Discuss an overview of the internal communication systems, training system and career development pathway within the trainee’s own organisation.</li> </ul>  | CCO<br>1.10   | 11   |                        |

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|                                      | <p>b) Demonstrate a commitment to extend and develop up-to-date technical knowledge through reading relevant engineering publications, participating in seminars or conferences, and information searching.</p> <p>c) Demonstrate a commitment to extend and develop up-to-date knowledge of local, regional and international current affairs through reading relevant engineering publications, participating in seminars or conferences, and information searching.</p> <p>d) Demonstrate a commitment to participate in the local organisations or community services for general personal development.</p> | <p><i>CCO 1.2</i></p> <p><i>CCO 1.3</i></p> <p><i>CCO 1.3</i></p> | <p>11</p> <p>11</p> <p>11</p> |                        |
|                                      | 1.2 Information about the HKIE  |   |                               |                        |
| <b>Location 2</b>                    | <b>Description 2</b>  |   |                               |                        |
|                                      | <p>a) Discuss an overview of the HKIE organisation as well as its history and role in society.</p> <p>b) Demonstrate a commitment to participate in relevant activities organised by the HKIE.</p>  | <p><i>CCO 1.1</i></p> <p><i>CCO 1.1</i></p>                       | <p>11</p> <p>11</p>           |                        |
|                                      | <b>2. Engineer as a Profession</b>  |   |                               | <b>Continuous</b>      |
|                                      | 2.1 Professionalism   |   |                               |                        |
| <b>Location 3</b>                    | <b>Description 3</b>  |   |                               |                        |
|                                      | <p>a) Discuss the social and ethical responsibilities of engineers in society.</p>  | <p><i>CCO 1.2</i></p>   | <p>8</p>                      |                        |

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|                                      | <p>b) Explain the rules and standard requirements of conducting engineering activities to the HKIE, employers, clients, general public and colleagues in accordance with the HKIE Rules of Conduct.</p> <p>c) Explain the ethical standards and responsibilities of professional engineers as required by the HKIE.</p> <p>d) Demonstrate the awareness to follow the codes of practice of professional engineers.</p> <p>e) Demonstrate the awareness to uphold the dignity, standing and reputation of the engineering profession.</p> <p>f) Demonstrate the awareness to protect the interests of the community including the environment, welfare, health and safety in conducting engineering activities.</p> | <p><i>CCO 1.2</i></p> <p><i>CCO 1.2</i></p> <p><i>CCO 1.2</i></p> <p><i>CCO 1.2</i></p> <p><i>CCO 1.2</i></p>   | <p>8</p> <p>8</p> <p>8</p> <p>8</p> <p>8</p> |                        |
|                                      | 2.2 Occupational Safety and Health   |   |  |                        |
| <b>Location 4</b>                    | <b>Description 4</b>   |   |  |                        |
|                                      | <p>a) Demonstrate an understanding of the statutory health and safety requirements.</p> <p>b) Demonstrate an understanding of the responsibilities of professional engineers for the health and safety of the employers, employees and general public when engaging in engineering activities.</p> <p>c) Apply the safety management system in accordance with the industry standards and regulatory requirements.</p> <p>d) Analyse the potential risks of the handling, assembly and installation of equipment and plants on site.</p> <p>e) Evaluate the potential safety impacts from the handling, assembly and installation of equipment and plants on site.</p>   | <p><i>CCO 1.5</i></p> <p><i>CCO 1.5</i></p> <p><i>CCO 1.5</i></p> <p><i>CO 2.3.3</i></p> <p><i>CO 2.3.3</i></p> | <p>9</p> <p>9</p> <p>7</p> <p>7</p> <p>9</p> |                        |

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|                                      | 2.3 Environment   |                    |                      |                        |
| <b>Location 5</b>                    | <b>Description 5</b>  |                    |                      |                        |
|                                      | a) Demonstrate an understanding of the relevant statutory environmental requirements related to the trainee’s discipline. | <i>CCO 1.6</i>     | 9                    |                        |
|                                      | b) Evaluate the inter-relationship of technology with the environment in the work place.                                  | <i>CCO 1.6</i>     | 9                    |                        |
|                                      | c) Demonstrate the awareness of the impact of technology on the environment in society.                                   | <i>CCO 1.6</i>     | 9                    |                        |
|                                      | <b>3. Engineering Design, Practice, Product Engineering and Manufacturing</b>   |                    |                      | <b>50</b>              |
|                                      | 3.1 Workshop Practice   |                    |                      | 4                      |
| <b>Location 6</b>                    | <b>Description 6</b>  |                    |                      |                        |
|                                      | a) Apply the engineering practice in the product and/or service.  | <i>New CO</i>      | 1                    |                        |
|                                      | b) Evaluate the workmanship quality of the product and/or service.  | <i>New CO</i>      | 3                    |                        |
|                                      | c) Perform engineering design and solutions process, product implementation and manufacturing process.                    | <i>New CO</i>      | 3                    |                        |
|                                      | d) Appraise Artificial Intelligence (AI) and robotics in ENS application.   | <i>New CO</i>      | 11                   |                        |
|                                      | e) Undertake practical works in IOT devices and systems installation and setup.   | <i>New CO</i>      | 11                   |                        |
|                                      | 3.2 Production Engineering *  |                    |                      | 38                     |
| <b>Location 7</b>                    | <b>Description 7</b>  |                    |                      |                        |
|                                      | 3.2.1 Product or Service Specification  |                    |                      | 2                      |
|                                      | a) Analyse the user requirements, product and/or service specifications.  | <i>CO 1.4</i>      | 3                    |                        |
|                                      | 3.2.2 Engineering Design and Solutions  |                    |                      | 16                     |
|                                      | a) Compile basic data to identify the work problem.   | <i>CO 1.1</i>      | 3                    |                        |
|                                      | b) Carry out thinking / analytical process to define the work problem.  | <i>CO 1.1</i>      | 3                    |                        |

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|                                      | c) Evaluate alternative solutions to an engineering problem from technical perspectives.   | <i>CO 1.2</i>      | 12                   |                        |
|                                      | d) Evaluate alternative solutions to an engineering problem from financial perspectives.   | <i>CO 1.2</i>      | 12                   |                        |
|                                      | e) Apply design concepts on projects.  | <i>CO 1.2</i>      | 4                    |                        |
|                                      | f) Analyse the effects of any other external constraints on the design principles.   | <i>CO 1.2</i>      | 4                    |                        |
|                                      | g) Produce clear and concise record in Quarterly Reports detailing the appreciation of the factors involved in the choice of the adopted engineering solutions.                    | <i>CO 1.2</i>      | 4                    |                        |
|                                      | h) Appraise the International Standards, taking into account their limitations.  | <i>CO 1.3</i>      | 1                    |                        |
|                                      | i) Appraise the Hong Kong Standards, Codes of Practice, Technical Memorandum etc. taking into account their limitations.   | <i>CO 1.3</i>      | 2                    |                        |
|                                      | j) Examine the list of documents and their relevance to the works recorded in Quarterly Reports.   | <i>CO 1.3</i>      | 2                    |                        |
|                                      | 3.2.3 Implementation Process   |                    |                      | 4                      |
|                                      | a) Examine the duties and responsibilities of all parties in a contract exercise by appreciating the practical application of the various documents forming a particular contract. | <i>CO 2.1.1</i>    | 1                    |                        |
|                                      | b) Apply procedures to keep record for the issue and/or receipt, registration and filing of work instructions and/or drawings and amendments.                                      | <i>CO 2.1.2</i>    | 1                    |                        |

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|                                      | <ul style="list-style-type: none"> <li>c) Carry out accurate daily records of events and instructions.</li> <li>d) Appraise engineering drawings.</li> <li>e) Execute work instructions.</li> </ul>  | <p><i>CO 2.1.3</i></p> <p><i>CO 2.1.4</i></p> <p><i>CO 2.1.4</i></p>                        | <p>1</p> <p>1</p> <p>1</p>          | 16                     |   |
|                                      | <p>3.2.4 Production and Manufacturing</p> <ul style="list-style-type: none"> <li>a) Appraise production engineering designs and prototypes as well as environmental, health and safety.</li> <li>b) Appraise production process control and documentations from the procurement of raw materials and/or the components of a system through production or site assembly to testing of final product, the component parts of a system and/or the complete system and the subsequent packaging and shipping.</li> </ul> | <p><i>New CO</i></p> <p><i>New CO</i></p>   | <p>1, 9</p> <p>1</p>                |                        |   |
|                                      | 3.3 Quality Control  |   |                                     |                        | 8 |
| <b>Location 8</b>                    | <b>Description 8</b>   |   |                                     |                        |   |
|                                      | <ul style="list-style-type: none"> <li>a) Carry out works of installation, commissioning, operating and maintenance.</li> <li>b) Appraise test report.</li> <li>c) Apply works test procedures for major plants and /or product.</li> <li>d) Apply procedures in the handling, assembly and installation of equipment and plants on site, with emphasis on control of workmanship.</li> </ul>  | <p><i>CO 2.3.1</i></p> <p><i>CO 2.3.2</i></p> <p><i>CO 2.3.2</i></p> <p><i>CO 2.3.3</i></p> | <p>6</p> <p>5</p> <p>6</p> <p>6</p> |                        |   |
|                                      | <b>4. Engineering Administration and Management</b>  |   |                                     | <b>27</b>              |   |
|                                      | 4.1 Project Management*  |   |                                     | 13                     |   |
| <b>Location 9</b>                    | <b>Description 9</b>   |   |                                     |                        |   |
|                                      | <ul style="list-style-type: none"> <li>a) Discuss the various leadership qualities required of a leader including accountability, conflict management and resources management etc.</li> </ul>   | <p><i>CCO 1.9</i></p>   | <p>6</p>                            |                        |   |

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|                                      | <ul style="list-style-type: none"> <li>b) Explain the importance of accountability and responsibility required by a leader for making decisions on engineering activities.</li> <li>c) Apply various management skills in engineering projects.</li> <li>d) Distinguish the relationship between good leadership and good management skills.</li> <li>e) Demonstrate an understanding of the importance of teamwork and partnering skills in engineering projects.</li> <li>f) Carry out planning and scheduling of engineering project activities.</li> <li>g) Examine the project progress against the schedule and make necessary amendment.</li> </ul> | <p><i>CCO 1.9</i></p> <p><i>CCO 1.9</i></p> <p><i>CCO 1.9</i></p> <p><i>CCO 1.9</i></p> <p><i>CO 3.1</i></p> <p><i>CO 3.2</i></p> | <p>6</p> <p>6</p> <p>6</p> <p>6</p> <p>6</p> <p>6</p> |                        |
|                                      | 4.2 Material Procurement   |   |   | 4                      |
| <b>Location 10</b>                   | <b>Description 10</b>  |   |   |                        |
|                                      | <ul style="list-style-type: none"> <li>a) Apply production methods, planning, quality assurance and control methods, progress methods and the associated documentation from the procurement of raw materials and/or the components of a system through production or site assembly to testing of final product, the component parts of a system and /or the complete system.</li> </ul>  | <p><i>CO 2.2</i></p>  | <p>6</p>  |                        |
|                                      | 4.3 Product Liability and Servicing *  |   |   | 10                     |
| <b>Location 11</b>                   | <b>Description 11</b>  |   |   |                        |
|                                      | <ul style="list-style-type: none"> <li>a) Appraise the product life cycle.</li> <li>b) Appraise the International Standards, taking into account their limitations.</li> <li>c) Appraise the Hong Kong Standards, Codes of Practice, Technical Memorandum etc. taking into account their limitations.</li> </ul>   | <p><i>New CO</i></p> <p><i>CO 1.3</i></p> <p><i>CO 1.3</i></p>  | <p>3</p> <p>1</p> <p>2</p>                            |                        |

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|                                      | <b>5. Objective Training – Project on Engineering Design / Production Engineering / Quality Control</b>   |                    |                      | <b>26</b>              |
|                                      | <i>This section allows the trainee to put to use, under supervision, a wide range of the knowledge gained in academic studies and in the course of the training programme. The trainee should be given responsibilities and commensurate authority to render a useful and productive service.</i> |                    |                      |                        |
|                                      | <b>6. Other Common Core Outcomes for Continuous Development</b>   |                    |                      | <b>Continuous</b>      |
|                                      | 6.1 Development of Personal Qualities   |                    |                      |                        |
| <b>Location 12</b>                   | <b>Description 12</b>   |                    |                      |                        |
|                                      | a) Identify appropriate innovative approach and/or tools for professional development.  | CCO 1.4            | 11                   |                        |
|                                      | b) Demonstrate interpersonal skills for professional development.   | CCO 1.4            | 10                   |                        |
|                                      | c) Demonstrate negotiating skills required for various engineering activities.  | CCO 1.4            | 10                   |                        |
|                                      | d) Demonstrate sound time management skills for professional development.   | CCO 1.4            | 11                   |                        |
|                                      | e) Demonstrate a commitment to continuous development and enhancement.  | CCO 1.4            | 11                   |                        |
|                                      | 6.2 Communication   |                    |                      |                        |
| <b>Location 13</b>                   | <b>Description 13</b>   |                    |                      |                        |
|                                      | a) Communicate ideas orally in an accurate and clear manner under various situations (including presentations and meetings).  | CCO 1.7            | 10                   |                        |
|                                      | b) Formulate an oral presentation of complicated data and information in an effective and persuasive manner.  | CCO 1.7            | 10                   |                        |
|                                      | c) Produce grammatically correct, clear and concise documents (including memos, letters, instructions, reports, resumes and technical papers) which meet the business objectives.   | CCO 1.7            | 10                   |                        |

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|                                      | d) Evaluate the needs of the intended readers to design appropriate technical contents for communication.                         | <i>CCO 1.7</i>     | 10                   |                        |
|                                      | e) Communicate effectively with oral and / or written presentation of user requirements, product and/or service specifications.   | <i>CO 1.4</i>      | 10                   |                        |
|                                      | 6.3 Human Resources Management  |                    |                      |                        |
| <b>Location 14</b>                   | <b>Description 14</b>   |                    |                      |                        |
|                                      | (a) Demonstrate the awareness of the duties and employment criteria for different job positions in an engineering project.        | <i>CCO 1.8</i>     | 6                    |                        |
|                                      | (b) Demonstrate an understanding of the relevant legal requirements and regulatory issues of labour employment and management.    | <i>CCO 1.8</i>     | 6                    |                        |
|                                      | (c) Discuss the appropriate staff training and development programmes in the organisation.  | <i>CCO 1.8</i>     | 6                    |                        |
|                                      | 6.4 Business Operations   |                    |                      |                        |
| <b>Location 15</b>                   | <b>Description 15</b>   |                    |                      |                        |
|                                      | a) Recognise the importance of intellectual property to business operations.  | <i>CCO 1.11</i>    | 11                   |                        |
|                                      | b) Describe the legal requirements in Hong Kong relevant to intellectual property rights.   | <i>CCO 1.11</i>    | 11                   |                        |
|                                      | c) Identify appropriate tools and method to measure and improve the productivity of business operations.                          | <i>CCO 1.11</i>    | 11                   |                        |
|                                      | d) Identify appropriate information technology applications to manage business information and to facilitate business operations. | <i>CCO 1.11</i>    | 11                   |                        |
|                                      | e) Recognise the importance of research and development towards business operations.  | <i>CCO 1.11</i>    | 11                   |                        |
|                                      | f) Demonstrate the awareness of financial considerations in operating business.   | <i>CCO 1.11</i>    | 11                   |                        |
|                                      | g) Recognise the importance of business development in business operations.   | <i>CCO 1.11</i>    | 11                   |                        |

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D = Desirable

\* = Part of these items can be incorporated into Objective Training to make a total of maximum 52 weeks of such training.

**N.B.**

1. The training period must not be less than 104 weeks (24 months).
2. The programme set out is for guidance only but substantial departure should not be made. Employers should endeavour to provide training to their trainees in as many areas as possible as is appropriate to the sector of employment.
3. This guide should be read in conjunction with Section 3 of the M3 Routes to Membership.
4. During the training, each trainee is required to maintain a Graduate Training Log Book, Record of Continuing Professional Development and Record of Training Outcomes.