

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

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Competence Ref.	Length of Time (weeks)
	1. Introduction			1
	1.1 Information about the Company			
<i>Location 1</i>	<i>Description 1</i>			
	1.1.1 Own Organisation			
	a) Discuss the size, history and internal culture of the trainee’s own organisation.	<i>CCO</i> <i>1.10</i>	11	
	b) Discuss an overview of the relationship between the trainee’s own organisation, government departments and other organisations.	<i>CCO</i> <i>1.10</i>	11	
	c) Discuss the structure and functions of different units within the trainee’s own organisation.	<i>CCO</i> <i>1.10</i>	11	
	d) Demonstrate the awareness to follow operational procedures and practices as required by the trainee’s own organisation.	<i>CCO</i> <i>1.10</i>	11	
	e) Discuss the objectives, requirements and processes that support the quality assurance system within the trainee’s own organisation.	<i>CCO</i> <i>1.10</i>	11	
	f) Apply the quality assurance system according to the policy of the trainee’s own organisation.	<i>CCO</i> <i>1.10</i>	11	
	1.1.2 Training Programme, Prospects and Career Development			
	a) Discuss an overview of the internal communication systems, training system and career development pathway within the trainee’s own organisation.	<i>CCO</i> <i>1.10</i>	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>1.1.3 Users of Information Infrastructure</p> <p>a) Analyse user requirements to formulate a solution.</p> <p>b) Design acceptable criteria of projects.</p> <p>c) Carry out testing process of projects.</p> <p>d) Evaluate the testing results.</p> <p>e) Carry out change management.</p> <p>f) Produce a well-structured, clear and concise user manual.</p>	<p><i>CCO 1.2</i></p> <p><i>CCO 1.3</i></p> <p><i>CCO 1.3</i></p> <p><i>CO 1.3</i></p> <p><i>CO 1.3</i></p> <p><i>CO 1.3</i></p> <p><i>CO 1.3</i></p> <p><i>CO 1.3</i></p> <p><i>CO 1.3</i></p>	<p>11</p> <p>11</p> <p>11</p> <p>3</p> <p>4</p> <p>6</p> <p>3</p> <p>6</p> <p>10</p>	
	1.2 Information about the HKIE			
Location 2	Description 2			
	a) Discuss an overview of the HKIE organisation as well as its history and role in society.	<i>CCO 1.1</i>	11	

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	b) Demonstrate a commitment to participate in relevant activities organised by the HKIE.	<i>CCO 1.1</i>	11	
	2. Engineer as a Profession			Continuous
	2.1 Professionalism			
Location 3	Description 3			
	a) Discuss the social and ethical responsibilities of engineers in society.	<i>CCO 1.2</i>	8	
	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.	<i>CCO 1.2</i>	8	
	c) Explain the ethical standards and responsibilities of professional engineers as required by the HKIE.	<i>CCO 1.2</i>	8	
	d) Demonstrate the awareness to follow the codes of practice of professional engineers.	<i>CCO 1.2</i>	8	
	e) Demonstrate the awareness to uphold the dignity, standing and reputation of the engineering profession.	<i>CCO 1.2</i>	8	
	f) Demonstrate the awareness to protect the interests of the community including the environment, welfare, health and safety in conducting engineering activities.	<i>CCO 1.2</i>	8	
	2.2 Appreciation of information ethics			
Location 4	Description 4			
	a) Comprehend an understanding of the information engineering ethics and codes of practice including copyright, data privacy, data protection and security, and the Hong Kong legislation on intellectual property.	<i>CO 1.1</i>	2	

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	2.3 Occupational Safety and Health			
Location 5	Description 5			
	a) Demonstrate an understanding of the statutory health and safety requirements.	<i>CCO 1.5</i>	9	
	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.	<i>CCO 1.5</i>	9	
	c) Apply the safety management system in accordance with the industry standards and regulatory requirements.	<i>CCO 1.5</i>	7	
	2.4 Environment			
Location 6	Description 6			
	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	
	3. Supporting the Information Environment			27
	3.1 Familiarisation with existing standards			2
Location 7	Description 7			
	a) Comprehend the required standards in software development life cycle for a specific framework and methodology.	<i>CO 2.3.1</i>	11	
	3.2 Familiarisation with change requests			3
Location 8	Description 8			
	a) Perform change request management.	<i>CO 2.3.2</i>	4	

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Location where Training will be done	Training Outcomes	Previous Reference	HKIE Competence Ref.	Length of Time (weeks)
	3.3 Familiarisation with existing information systems’ designs			3
Location 9	Description 9			
	a) Apply basic and current information discipline skills and knowledge including software skills, hardware and network skills, logic training and technology updates.	<i>CO 1.2</i>	1	
	3.4 Familiarisation telecommunications system			4
Location 10	Description 10			
	a) Comprehend the knowledge of telecommunications systems including basic operation principles, future evolution and relevant regulatory issues.	<i>CO 2.3.3</i>	4	
	3.5 Familiarisation with Information Systems Administration			7
Location 11	Description 11			
	a) Perform user profile management.	<i>CO 2.1.2</i>	6	
	b) Communicate effectively with service providers for liaison.	<i>CO 2.1.2</i>	10	
	c) Produce well-structured, clear and concise operational documentation.	<i>CO 2.1.2</i>	10	
	d) Perform incident management.	<i>CO 2.1.2</i>	6	
	e) Comply security protection operations in alignment with corporate requirements.	<i>CO 2.1.2</i>	1	
	3.6 Familiarisation with Diagnosis of problems			6
Location 12	Description 12			
	a) Communicate effectively with relevant professionals for fault reporting.	<i>CO 2.3.2</i>	10	
	b) Develop procedures and protocols for diagnostics and trouble shooting.	<i>CO 2.3.4</i>	4	
	c) Perform testing procedures for functionality, diagnostic tools and debugging approaches.	<i>CO 2.3.4</i>	6	

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Location where Training will be done	Training Outcomes	Previous Reference	HKIE Competence Ref.	Length of Time (weeks)
	3.7 Familiarisation with data collection for future use			2
Location 13	Description 13			
	a) Perform data collection for evaluation of performance, feedback and design improvement	CO 2.3.5	3	
	4. Computer Operation Environment			20
	4.1 Familiarisation with Server Room Operation			8
Location 14	Description 14			
	a) Comprehend information security as applicable to Server Room operation.	CO 2.1.1	1	
	b) Comprehend the importance of logging and monitoring requirements.	CO 2.1.1	1	
	c) Apply storage maintenance process.	CO 2.1.1	4	
	d) Appraise the operational procedures for system management.	CO 2.1.1	1	
	e) Perform system management.	CO 2.1.1	6	
	f) Develop procedures and protocols and the use of tools for diagnostics and trouble shooting.	CO 2.1.1	4	
	g) Perform testing procedures for functionality, and comprehend the use of diagnostic tools and debugging techniques.	CO 2.1.1	6	
	h) Perform system backup and error recovery operations.	CO 2.1.1	6	
	i) Propose improvement for performance evaluation.	CO 2.1.1	4	
	j) Comprehend the knowledge and importance of facility environment.	CO 2.1.1	1	
	k) Perform facility environment operations.	CO 2.1.1	3	
	4.2 Familiarisation with Network Environment			8
Location 15	Description 15			
	a) Analyse network performance problems.	CO 2.3.5	3	
	b) Plan the handling and installation of network equipment.	CO 2.2.1	4	
	c) Comprehend knowledge on network architecture design, planning and installation.	CO 2.2.2	1	

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Location where Training will be done	Training Outcomes	Previous Reference	HKIE Competence Ref.	Length of Time (weeks)
	d) Perform network planning, installation, operation and management.	<i>CO 2.2.2</i>	6	
	e) Develop procedures and protocols for diagnostics and trouble shooting.	<i>CO 2.2.2</i>	4	
	f) Perform testing and maintenance procedures for functionality, and comprehend the use of diagnostic tools and debugging techniques.	<i>CO 2.2.2</i>	6	
	g) Identify improvement for performance evaluation.	<i>CO 2.2.2</i>	4	
	h) Plan network expansion and equipment procurement.	<i>CO 2.2.3</i>	4	
	i) Comprehend the knowledge and importance of network security.	<i>CO 2.2.4</i>	7	
	j) Evaluate potential risks from improper management of network security.	<i>CO 2.2.4</i>	7	
	4.3 Familiarisation with Software Maintenance			4
Location 16	Description 16			
	a) Develop procedures and protocols for diagnostics and trouble shooting.	<i>CO 2.2.2</i>	4	
	b) Perform testing and maintenance procedures for functionality.	<i>CO 2.2.2</i>	6	
	c) Comprehend the use of diagnostic tools and debugging techniques.	<i>CO 2.2.2</i>	6	

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	5. Objective Design Training			56
	<p><i>Trainee must be involved in technology-oriented design aspects as well as management-oriented aspects of planning, implementing and commissioning of new systems and/or major enhancements to existing systems.</i></p> <p><i>Design should include considerations for maintainability as well as reusability. All aspects of this work should draw previous experience. In particular, familiarity with international and installation standards should find practice here. The Objective Design Training may involve learning of new methodologies, programming tools, programming languages, language extensions and Computer Aided Software Engineering (CASE) Tools. It is expected that the trainees will be provided with a good working environment such as advanced workstations, CASE Tools (Integrated Tools preferred), good library, Computer Aided Learning facilities etc. Close supervision of trainees should meet with the dual objectives of effective technology.</i></p>			
	5.1 Technical Design and Management Aspects			30
Location 17	Description 17			
	a) Design technical specifications including requirement analysis, architectural design, detailed design and system commissioning.	<i>CO 2.4.1</i>	4	
	b) Develop procedures for Acceptance Test Planning, Unit Testing, Integration Testing and Load tests	<i>CO 2.4.2</i>	4	
	c) Design maintenance measures to aid in the efficient operation of the system parameters.	<i>CO 2.4.3</i>	4	
	d) Justify option on design / management of information infrastructure.	<i>CO 2.4.3</i>	12	

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	5.2 Project Administration and Management			26
Location 18	Description 18			
	a) Plan project management activities including schedule, personnel administration, budgeting and documentation.	<i>CO 3.1</i>	6	
	b) Perform project management including progress monitoring, personnel, budget and documentation.	<i>CO 3.1</i>	4	
	c) Examine the project progress against the schedule for necessary amendment.	<i>CO 3.2</i>	5	
	d) Develop relevance to engineering discipline, within the context of marketing, customer interface and user support / maintenance.	<i>CO 3.3</i>	6	
	6. Other Common Core Outcomes for Continuous Development			Continu ous
	6.1 Development of Personal Qualities			
Location 19	Description 19			
	a) Identify appropriate innovative approach and/or tools for professional development.	<i>CCO 1.4</i>	11	
	b) Demonstrate interpersonal skills for professional development.	<i>CCO 1.4</i>	10	
	c) Demonstrate negotiating skills required for various engineering activities.	<i>CCO 1.4</i>	10	
	d) Demonstrate sound time management skills for professional development.	<i>CCO 1.4</i>	11	
	e) Demonstrate a commitment to continuous development and enhancement.	<i>CCO 1.4</i>	11	
	6.2 Leadership and Management			
Location 20	Description 20			
	a) Discuss the various leadership qualities required of a leader including accountability, conflict management and resources management etc.	<i>CCO 1.9</i>	6	
	b) Explain the importance of accountability and responsibility required by a leader for making decisions on engineering activities.	<i>CCO 1.9</i>	6	

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	<ul style="list-style-type: none"> c) Apply various management skills in engineering projects. d) Distinguish the relationship between good leadership and good management skills. e) Demonstrate an understanding of the importance of teamwork and partnering skills in engineering projects. 	<p><i>CCO 1.9</i></p> <p><i>CCO 1.9</i></p> <p><i>CCO 1.9</i></p>	<p>6</p> <p>6</p> <p>6</p>	
	6.3 Communication			
Location 21	Description 21			
	<ul style="list-style-type: none"> a) Communicate ideas orally in an accurate and clear manner under various situations (including presentations and meetings). b) Formulate an oral presentation of complicated data and information in an effective and persuasive manner. c) Produce grammatically correct, clear and concise documents (including memos, letters, instructions, reports, resumes and technical papers) which meet the business objectives. d) Evaluate the needs of the intended readers to design appropriate technical contents for communication. 	<p><i>CCO 1.7</i></p> <p><i>CCO 1.7</i></p> <p><i>CCO 1.7</i></p> <p><i>CCO 1.7</i></p>	<p>10</p> <p>10</p> <p>10</p> <p>10</p>	
	6.4 Human Resources Management			
Location 22	Description 22			
	<ul style="list-style-type: none"> a) Demonstrate the awareness of the duties and employment criteria for different job positions in an engineering project. b) Demonstrate an understanding of the relevant legal requirements and regulatory issues of labour employment and management. c) Discuss the appropriate staff training and development programmes in the organisation. 	<p><i>CCO 1.8</i></p> <p><i>CCO 1.8</i></p> <p><i>CCO 1.8</i></p>	<p>6</p> <p>6</p> <p>6</p>	

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	6.5 Business Operations			
Location 23	Description 23			
	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	

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.