

**THE HONG KONG INSTITUTION OF ENGINEERS  
ENGINEERING GRADUATE TRAINING SCHEME “A”**

**MODEL TRAINING GUIDE**

**ELECTRONICS ENGINEERING**

**Model Training Guide (MTG)**

The Model Training Guide is a guide to Companies on the practical experiences considered relevant in the formal training of potential Professional Engineers.

**Training Programme (TP)**

The Training Programme is the plan prepared by a Company which is designed to meet the experiences listed in the MTG and to meet the objectives set out in the Record of Objectives. This ‘plan’ is presented for approval on Form TD1 Part 2 as a part of the Assessment/Reassessment procedures.

**Training Period - Nominally 2 years**

The length of the training is based on meeting the objectives and not determined by time. The times shown below are indicators only of the time that a trainee would normally take to meet the relevant objectives.

**Training Aim**

It is important to note that the Scheme “A” Graduate Training is designed to be a fast track by which a graduate can obtain full professional status. The training therefore covers both Technical and Professional matters.

**Continuing Professional Development (CPD)**

An implicit part of the Scheme “A” training is related to CPD which should be an integral and relevant part of the development of the graduate trainee.

**Training Programme Content**

*(C=Core, D=Desirable; \* =Items which may be incorporated into Objective Training to make a total of 67 weeks of such training)*

1. Introduction (1 week in total)
  - 1.1 Information about the company:
    - (a) Size, history, subsidiaries if any
    - (b) Products, markets and competitors
    - (c) Management structure and functions
    - (d) Communication systems
    - (e) Location and layout of the facilities
    - (f) Safety, health and welfare
    - (g) Joint consultation arrangements if any

1.2 Information about training programmes, prospects & career development:

- (a) Specialist skills
- (b) Work of related disciplines
- (c) Management techniques
- (d) Sources of guidance

2. Engineering design, practice, product engineering and manufacturing (12 months in total)

2.1 Workshop Practice (minimum 4 weeks C)

To teach the trainee basic engineering practice appropriate to the employers activities: knowledge and use of relevant hand, power, and machine tools together with relevant corporate and legislative safety requirements; mechanical aspects of electronic equipment, choice of materials, strength, and durability; casting, moulding and machining; wiring, connecting, fastening, soldering, welding, brazing. Hands-on experience should be provided where possible, and this training may be provided in a specialised training school where appropriate and available.

2.2 Product or Service Specification\* (minimum 2 weeks C)

To teach the trainee how a product or service is defined; what is required, for what purpose, by whom, in what time scale, where it is to be used and who is to use it; literature/product survey of what is presently available; feasibility, cost, time scale; service life and maintainability considerations; market review, marketability, level of demand, duration, production scheduling.

2.3 Engineering Design\* (minimum 20 weeks C)

To teach the trainee how a product or service is designed and defined in detail: computer aided design; drawing office practice, reading and preparation of schematic and working drawings, planning, scaling and layout; theoretical considerations; breadboarding and functioning testing; component specification; PC board processing; handling and care of IC's and other devices; worst case analysis and thermal design; preparation of prototypes, tolerances, reliability, maintainability, ergonomics, safety, health and environmental considerations, standards and regulations.

2.4 Production Engineering\* (16 weeks D)

To teach the trainee how engineering designs and prototypes are used to prepare for full scale production; selection of materials, tool design, moulds jigs and fixtures; definition of process methods, work specification, choice of technologies; plant and production line layout, design of testing equipment; product testing; fault analysis; production line safety, ergonomics, environmental health; manpower estimates,

productivity and costing; automation and numerical control.

2.5 Production (8 weeks D)

To teach the trainee how the product or service goes into full production; process control, production line tuning, sub assemblies, final assembly; method study, work measurement, productivity, costing; automated test, failure diagnosis; packaging, shipping, production and test record keeping; control of drawings; use of computer systems.

2.6 Quality Control (minimum 8 weeks C)

To teach the trainee aspects and importance of quality control; product test, burn in, environmental tests, acceptance standards, customer test requirements, customer acceptance, automated test, use of computers.

3. Engineering Administration, Management and Supporting Functions (6 months in total)

3.1 Project Management\* (minimum 6 weeks C)

To teach the trainee the benefits of teamwork and a logical approach to design and production; materials, manpower, budgets, programmes, critical path, contingency, supervision of subordinates, progress monitoring; use of computers.

3.2 Material Procurement (minimum 3 weeks C)

To teach the trainee how materials and services are procured and stored; material and component specifications and quality control, international specifications and standards; commercial terms; pre-qualification of suppliers; tender document preparation, tendering, tender security; tender evaluation, financing costs, deferred terms, credit guarantees, letters of credit, loans, loan scheduling and drawdown; delivery schedules and monitoring; shipping and material handling, stores procedures, material requirement planning, issue procedures; quality control, stock maintenance, shelf-life; use of computer systems.

3.3 Product Liability & Servicing (minimum 4 weeks D)

To teach the trainee about: legal liability, foreign law, liability insurance; servicing arrangements and foreign dealer negotiation and control; availability of spares, product life; defect monitoring, documentation and feedback to product design and production engineering; service and repair organisation.

3.4 Management & Commercial Activities (4 weeks D)

To teach the trainee other aspects of the employers management and commercial activities not covered in other areas of training; employee

recruitment, interviewing, review procedures, negotiations, progression schemes, motivation, performance reviews; timekeeping, holidays, labour legislation, personnel relations; insurance (product, machinery, buildings, consequential loss); banking, financial and management accounting, treasury; marketing and market research; corporate planning; communications; computing.

4. Objective Training – Project on Engineering Design/Production Engineering/Quality Control (6 months in total C)

To allow 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, and should render a useful and productive service.

**N.B.**

1. The minimum training period must not be less than 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 Membership Admission Requirements booklet.
4. During their training, each trainee is required to maintain a Graduate Training Log Book, CPD Logbook and Record of Objectives.