

# PRACTICAL TRAINING GUIDELINES FOR MECHANICAL ENGINEERS

## A: INTRODUCTION

- (a) Subject to the contents of these practical training guidelines, every trainee in the Mechanical engineering discipline shall complete training in the types of works specified for a minimum period of three years or as specified in the Engineers Registration Board Regulations 1999.
- (b) In the case of research workers and other specialists, where the nature of work renders it impracticable to adhere to the requirements set out in the contents of these practical guidelines, the Board shall evaluate each individual's case separately having due regard to the practical training approved for the time being by the Board.
- (c) The main thrust for professional and technician engineer trainees is as follows:-

### (i) *Professional engineers:-*

The main thrust is on knowledge, understanding subject matters, analysis and methods. Professional engineers must have analytical capabilities, adaptability to varying situations, ability to identify, rectify and design solutions, management capabilities, power and communication skills, adherence to the professional ethics and conduct as specified in the Engineers Registration Board Regulations 1999 and as amended from time to time.

### (ii) *Technician engineers:-*

The main thrust is on know-how of subject matters. Technician engineers must have independent judgement within the field, top class engineering applications, development of cost effective systems and safe procedures, applications of appropriate mathematics, science and related subjects, team and resource management.

## B: CONTENTS OF PRACTICAL TRAINING

### (a) **General Workshop Practice**

Every trainee shall work under the supervision of a registered professional Mechanical engineer for a minimum period of one year or as determined by the Board in accordance with the Engineers Registration Regulations during which time knowledge and experience should be acquired in most of the following areas:

- Foundry practice including pattern making
- Metal forming, including forging, drawing, etc
- Sheet metal work
- Heat treatment and electroplating
- Bench work, including marking, scribing, punching, scraping etc.
- Machine shop practice including drilling, shaping, turning, milling, grinding, hobbing etc.
- Welding including electric, gas, friction etc
- Finishing work including polishing, panel beating, shot blasting, spray painting etc.
- Electrical and electronic workshop practice including wiring installations, control circuits, electrical machinery handling etc.

- Carpentry and joinery work
- Masonry and kiln building
- Maintenance and repairs including inspection, disassembly, repair and assembly
- Installation, testing and calibration of machinery and plants.

**(b) Design (Mechanical Engineering office work)**

Every trainee shall work under the supervision of a registered professional Mechanical engineer for a minimum period of one year or as determined by the Board in accordance with the Engineers Registration Regulations during which time knowledge and experience should be acquired in most of the following areas:

- Development of design requirements, assumptions, and specifications
- Design calculations and drawings including application of computer Aided Design (CAD) programmes
- Layout drawings
- Fixing production time costs
- Redesign work/adaptation for maintenance
- Application of relevant standards and codes of practice
- Design of maintenance systems and schedules of repairs
- Damage research, including trouble shooting, damage/failure analysis and design of solutions to the damages/failures
- Analysis of impact on the environment and other systems of designs in application

**(c) Management**

Every trainee shall work under the supervision of a registered professional Mechanical engineer for a minimum period of one year or as determined by the Board in accordance with the Engineers Registration Regulations during which time knowledge and experience should be acquired in most of the following areas:

- General management including knowledge of organisation structures and their relation to production
- Labour management and staff relations, including knowledge of staff regulations, Labour laws, industrial laws etc.
- Production planning and control, including selection of production processes, tooling, supply of materials for production, storage and handling, allocation and control of labour, machine and material to ensure optimum production output
- Financial management including programming, and estimating (budgeting) costing and record keeping.
- Procurement and materials management including material specifications, tendering and storage
- Contract administration
- Quality control to ensure abidance to established quality standards
- Knowledge and practice of safety in production including of safety gear, safety precautions, environmental issues etc.
- Management of services for the welfare of production including staff welfare
- Office administration
- Communication skills