



MECHANICAL PRINCIPLES

This training course has been developed by OakCAD/NCT to meet the growing need for technician engineers to update or upgrade their basic mechanical knowledge and skills.

The course has been endorsed under the ABC Awards/Certa Quality Licence Scheme. This means that OakCAD/NCT has undergone an external quality check to ensure that the organisation and the courses it offers, meets defined quality criteria.

At the end of this course successful learners will receive a Certificate of Achievement from ABC Awards/Certa and a Learner Unit Summary (which lists the components the learner has completed as part of the course).

The course content has been developed in consultation with several of our large pharmaceutical and manufacturing clients over many years and can be provided as a tutor lead delivered course, as a distance learning course or flexibly, combining both methods.

This course is in modular form with each module individually assessed and consists of:

- 1 Course notes
- 2 Worked examples
- 3 Trainee self-assessments
- 4 Module assessments

On completion of all modules, there is an end of course and practical assessment.

Companies who are considering the development of their own Apprenticeship Scheme may wish to include this EAL accredited & certificated qualification into their plans.

If required OakCAD can also help develop an effective company scheme.

STUDY TIME

This course has been set at a level equivalent to Level 3 and it is expected that it will take you 20 - 30 hours of delivered time or approximately 60 hours of self-study time (distance learning).

COURSE FEE

The current level of course fees for distance learning courses is displayed on the NCT web site.

For delivered courses, please contact OakCAD.

REQUIREMENTS

To undertake this course, it would be helpful to have some basic engineering and mathematical knowledge. OakCAD/NCT is able to advise you as to whether you have the necessary background knowledge and experience to undertake this course.

INDUSTRY

Although written for the pharmaceutical industry it is also appropriate for the Petro- chemical industry, Food Manufacture or any industry using automatic production lines and processes or having a modern maintenance requirement.



MECHANICAL PRINCIPLES

- 1 Safety in the Workplace**
- 2 Use of Hand Tools**
Use to include spanners, screwdrivers (for different types of screw), Allen keys etc.
Safe working practices.
- 3 Measurement**
Including micrometers, vernier gauges, dial gauges etc.
- 4 Limits & Fits**
- 5 Engineering Drawing**
- 6 Fasteners**
Types - to include bolts, nuts, screws, locknuts, washers, retaining rings, pins rivets etc.
Safe use and reasons for failure, where appropriate
- 7 Engineering Components & Assemblies**
 - 5.1 Standard components
 - Bearings - ball, roller, journal, linear
 - Belts - flat, vee, toothed etc. to include chain drives
 - Seals - types including gaskets
 - Keys - types
 - 5.2 Engineering components and assemblies
 - Shafts - Keyways, surface finish, reasons for shape
 - Pulleys - types, assembly features, speeds
 - Gears - types, uses, speeds
 - Limits and fitsTo include good working practices in maintenance
- 8 Units**
SI and derived units
Use of prefix
- 9 Force, Mass, Bending Moment & Torque**
Force, weight and mass and their difference
Bending moment and torque and their effect
- 10 Stress and Materials**
Stress as force per unit area, types of stress, safe working stresses
Materials & their properties
Vibrations and their effects
Corrosion and wear and its effect on components
Safe application and practices



11 Friction

Basic explanation and relationship between normal force and materials
Effect of different materials including coefficient of friction
Practical examples
Simple friction calculations

12 Machines & Machine Drives

Types including gears & belt drives
Force & Movement Ratio

