Engineering Training Programs

Part 1

Production & maintenance Engineering Programs

MACHINERY FOUNDATION & GROUTING

COURSE OBJECTIVES:

To provide Mechanical , Civil Engineers, Foreman and technicians with the principles of maintenance, repair and replacement of rotating machinery.

COURSE CONTENTS:

- Introduction.
- What's an epoxy (Epoxy gratis).
- Proper grout mincing is important.
- Conventional grouting.
- Methods of installing machinery.
- Pressure injection regretting.
- Foundation repairs.
- Pump bases plate installation and epoxy grouting.
- Base plate-leveling procedures. - Base plate preparation.
- New concrete preparation.
- Old concrete preparation.
- Anchor bolts.
- Grout forms.
- Detailed checklist for rotating equipment.
- Horizontal pump base plate checklist.
- Specification for Portland cement grouting.
- Specification for epoxies grouting of rotating equipment.

TARGET PARTICIPANTS:

Mechanical and civil Engineers, and Technicians.

LOCATION:

DURATION: One week

DATE:

Production & maintenance Engineering Programs

NEW CONCEPT FOR MAINTANCE SYSTEM

COURSE OBJECTIVES:

To Provide Engineers and technicians as well as Forman who involved in maintenance.

COURSE CONTENTS:

- Systems of Maintenance.
- Conventional Maintenance systems.
- State of the Art Technology for maintenance.
- Equipment Used for Machine Monitoring.
- Off - Line Monitoring.
- Data Acquisition Systems.
- Standard analyzer features and new technology.
- The concepts of predictive maintenance.
- Predictive (Condition Based) Maintenance.
- Benefits of new technology.

TARGET PARTICIPANTS:

Mechanical Engineers and technicians as well as Forman who involved in maintenance .

LOCATION:

DURATION: One week

DATE:

WORKSHOP MANAGEMENT

COURSE OBJECTIVES:

Give participants a better understanding of the workshop management and its elements and exploring it in details.

COURSE CONTENTS:

- Industrial organization .
- Workshop handling equipment.
- Shop safety.
- Metal used.
- Understanding drawing.
- Measurement .
- Hand tools (Clippers - chisels - swing - files - hand reaming).
- Clamping devices .
- Hand wrenches - screwdrivers Fasteners.
- Sheet Metal work.
- Forging.
- Soldering and brazing.
- Welding.
- Heat treatment of metals.
- Metal finishes.
- Grinding.
- Drills and Drilling machines.
- Power sawing
- Metal Lathe.
- Planning machines.
- Milling machine.
- Chapels machining.
- Metal spinning.
- Extrusion Processes.
- Flame Spraying.
- Electrical Discharge Machining.
- Explosive Forming.
- Chemical Milling.
- Powder Metallurgy.
- Cold Forming Metal Sheet.
- Automation.
- Quality Control.

INTEGRATED FAULT DIAGNOSTIC

COURSE OBJECTIVES:

Give participants an Understanding of Correct Measurement Parameter to Detect Vibration as well as other methods of diagnostic such as ‹problem diagnostic of Rotating Equipment's condition monitoring thermal Imaging camera as well as Ultrasonic system ‹infrared analysis ‹lysisoil ana

COURSE CONTENTS:

- Introduction to Machine Vibration
- .(Phase -Acceleration -Velocity -Displacement)Characteristics of machine vibration
- Predicative Maintenance Procedure : (PMP)
- Total Program (Detection - Analysis - Correction).
- Methods of Vibration Measurements.
- Methods of Vibration Measurements.
- Use of Vibration Equipment's .
- Data Acquisition.
- Standard Analyzer Features.
- Constant Monitoring System.
- Oil Analysis.
- Ultrasonic System.
- Infrared Analysis.
- Fault Diagnostic Technology.

TARGET PARTICIPANTS:

Mechanical Engineers and Technicians and Maintenance staff.

LOCATION:

DURATION: One week

DATE:

NOISE AT INDUSTRIES

COURSE OBJECTIVES:

To provide Engineers, Forman and technicians with the principle of Noise Mreasurments, Analysis, and control for Industries.

COURSE CONTENTS:

- Outline of the principles of sound propagation .

1. The measurement of Sound.
2. Subjective Aspects of Noise, Noise Rating Scales.
3. Community Response t Noise, Noise Rating Procedures.
4. Hearing Damage and Hearing Loss Criteria.
5. Workshope Acoustics.
6. Principles of Noise Control.
7. Noise From Vibrating Surfaces.
8. Aerodynamic Noise Sources.
9. Identification of Noise Sources.
10. Noise Control Procedures.
11. Case Study.

TARGET PARTICIPANTS:

Engineers and Forman as well as technicians at Industries.

LOCATION:

DURATION: One week

DATE:

Production & maintenance Engineering Programs

NOISE, ITS MEASURMENT, ANALYSIS, RATING AND CONTROL

COURSE OBJECTIVES:

To provide Mechanical, Electrical, Civil Engineers, Forman and technicians with the principle of Noise Mreasurments, analysis, and control.

COURSE CONTENTS:

- Outline of the principles of sound propagation.
- The measurement of Sound.
- Subjective Aspects of Noise, Noise Rating Scales.
- Community Response to Noise, Noise Rating Procedures.
- Hearing Damage and Hearing Loss Criteria.
- Room Acoustics.
- Principles of Noise Control .
- Noise From Vibrating Surfaces.
- Aerodynamic Noise Sources.
- Identification of Noise Sources.
- Noise Control Procedures.
- The Law Relating to Noise.
- Use Noise For Fault Diagnostic.

TARGET PARTICIPANTS:

Engineers and Forman as well as Technicians.

LOCATION:

DURATION: One week

DATE:

SYSTEM ENGINEERING

COURSE CONTENTS:

- Introduction to system engineering .
- The system Engineering process.
- System Design requirements. Engineering design methods and tools. Design review and evaluation .
- System engineering planning. Organization for system engineering. Contracting and supplier management. Case study examples.

Production & maintenance Engineering Programs

REVERSE ENGINEERING AS A TOOL IN ESTABLISHING THE DESIGN SPECIFICATION OF SPARE PARTS AND MANFACTURING

COURSE OBJECTIVES:

To meet the knowledge and skills require to build /or develop main henna manufacturing personnel in industrial projects, power plants, refineries and oil field installation.

COURSE CONTENTS:

- Introduction to the system of reverse engineering.
- Specification of materials .
- Methods of production.
- Fit & Tolerances (dimensions system).
- GD & Tolerances.
- Designing machine members subjected to variable loads.
- Power transmission shafting .
- Coupling design .
- Keys, pins and splines .
- Power serews and threaded fasteners.
- Stresses in pressure vessels.
- Steps of reverse engineering
- Cass study

LOCATION:

DURATION: One week

DATE:

MATERIAL SELECTION

COURSE OBJECTIVES:

To meet the knowledge and skills required to build /or develop design planning production, and material engineering personnel in industrial projects, and refineries oil field installation and power plants.

COURSE CONTENTS:

- Background materials.
- Selection for mechanical properties.
- Selection for surface durability.
- Case studies in material selection
- Air frame
- Ship structure.
- Engines and power generation
- Auto mobile structure.
- Bearings.

LOCATION:

DURATION: One week

DATE:

Production & maintenance Engineering Programs

LONG PROGRAM FOR PROMOTION
THE TECHNICANS

COURSE OBJECTIVES:

To meet the knowledge and skills required to promote the technicians who are working in the field of maintenance, power plants, refineries and oil field installation.

COURSE CONTENTS:

- Failure analysis and Types and causes of filure.
- Welding Engineering. Inspection methods of welding joints and quality control. Specification of welding the refinery tower and stocking. Tanks (Cylindrical, Spherical).
- Injectors.
- Piping.
- Manfacturir of pipes (API)
- Different metals in manfacturing the pipes. Structure steel.
- Lining and csating of pipes.
- Pipe Fittings. Flanges.
- Pipe work dimensions. Flanges Gaskets.
- Tools of special servias(equipments & Instruments). Valves.
- Pipe expansion devices. Pipe support & hangers. Installation for piping . Hydrostatic - pressure tests. API line pipe specification. Case study.
- Engineering material .
- Mechanical and Non destructive tests. The Macro - examination of metals.
- The micro - examination of metals. Solidification of metals.
- Equilibrium diagrams and their interpretation . Hardening of metals.

LONG PROGRAM FOR PROMOTION
THE TECHNICANS

- Deformation and annealing of metals. Corrosion and oxidation pheno mena. Irons and carbon steels.
- Alloy steels & Cast irons. Electrical and magentic alloys.
- Copper and its alloys.
- Aluminium, Magnesium and light alloys.
- Titanium and other new metals.
- Polymers.
- Metallurgical aspects of metal foining. The measurement of femperature. Heattreatment .
- Classification of metals and non metals.
- Strength of materials.
- Normal stresses
- Bending stresses
- Shear stresses.
- Maximum and normal stresses.
- Metal fits and tolerances.
- Forces and torques.
- Assembly of shrinkage fits .
- Designing machine members subjected to variable loads.
- Power transmission shafting.
- Coupling design.

LONG PROGRAM FOR PROMOTION
THE TECHNICANS

- Keys, pins and splines.
- Power serews and threaded fasteners. Solved problems .
- Forms and dimensions of produced materials . Maintencace programs.
- Preventive maintenance planning and scheduling. Maintenance workshop, organization , equipment and layout.
- Application on Gear drives and speed reducers. Common Gear types.
- Trouble shooting Gears.
- Surface deterioration and maintenance. Case study.
- Rotary machines. Pumps
- Compressors.
- Turbines.
- Gus turbines.
- Trouble shooting.
- Maintenance of Pumps turbines, and Gas turbines.
- Ventilating Fans
- Dust Csllecting equipment.

LOCATION:

DURATION: One week

DATE:

COURSE OBJECTIVES:

To provide Mechanical , Civil Engineers, Foreman and technicians with the principles of the advanced maintenance management.

COURSE CONTENTS:

- Maintenance and operation management .
- New concepts of maintenance.
- Types of maintenance and its classification.
- Role of maintenance in improving quality and productivity.
- Organizing maintenance operations.
- Maintenance planning and scheduling:
- Modern techniques used in planning control.
- Maintenance programs (PEERT and CPM).
- Preventive maintenance planning and scheduling.
- Spare parts and assemblies management and planning: (types of spare parts and classification of their inventories).
- Spare parts rate of consumption and requirements.
- Lead time and re-order point.
- Spare parts renewing - Journal bearings failures and maintenance - Maintenance of machines parts - Fits and tolerances.
- Industrial saftey maintenance operations.
- Causes of accidents and accidents analysis and Safety precautions.
- Maintenance workshops, Organization, equipment and lagout.

TARGET PARTICIPANTS:

Maintenance personnel, process engineers and technicians of all levels in industrial projects, power plants, refineries and oil field instalations.

LOCATION:

DURATION: One week

DATE:

MANAGING TRANSPORTATION AND HANDLING FACILITIES

COURSE OBJECTIVES:

Familiarizes participants with modern methods of transportation and handling facitlities; and enhances their skills to plan and manage them effectively.

COURSE CONTENTS:

- Classification of handling equipment.
- Classification of transportation equipment.
- Why planning, transportation and handling .
- Garage management.
- Methods of selection of handling and transportation equipment.
- Basic factors in planning transportation.
- Role of land use, people, economic activities and vehicles ownership in transportation planning.
- Analyzing the present situation to improve transportation.
- Quantitative methods to forecast transportation demand.
- Economic of handling and transportation operations.
- Mathematical modeling in transportation activities .
- Maintenance management of transportation and handling facilities.
- Organization of transportation and handling equipment spare parts atores.
- Computer application in transportation management .

TARGET PARTICIPANTS:

All staff involved in transportation , handling and rigging in all institutions.

LOCATION:

DURATION: One week

DATE:

Production & maintenance Engineering Programs

APPLIED RPODUCTION AND OPERATION MANAGEMENT

COURSE OBJECTIVES:

Provides participants with full understanding of the tools used in production and operation management. The course will develop participants skills in using advanced tools in this area

COURSE CONTENTS:

- Concepts and Tools in Production and Operations Management.:
- Introduction to production/ operations management.
- Productivity, quality and cost.
- Concepts of decision making.
- Information systems in PIOM.
- Forecasting
- Process design and ficility layout.
- Tactical Issues in Production and Operations Management.
- Material requirements planning.
- Operations scheduling and production control.
- Material Management.

TARGET PARTICIPANTS:

All persons who are responsible for production planning on the enterprise level or on operational levels.

LOCATION:

DURATION: One week

DATE:

COURSE OBJECTIVES:

An introduction of computer numerical control (CNC) practices using Fanuc. Includes the use of the Cartesian coordinate system, programming codes and command, and tooling requirements.

Student Learning Outcomes: (Competences)

Describe CNC machining and uses, and applications of CNC program.

Describe the capabilities and limitations of computer numerical control

(CNC) equipment.

Describe the Cartesian coordinate system as used in a CNC machine program.

Describe the differences in absolute and incremental dimensioning as related to an ISO programming of a CNC machine.

List and describe commands for CNC machine codes.

List and describe the purpose or function of the preparatory commands for a CNC machine (G-codes).

List and describe the purpose or function of the miscellaneous commands used with a CNC machine (M-codes).

List and describe the purpose of other alphabetical commands used in

programming operations of a CNC machine.

Describe and select tooling for CNC operations to project specifications.

Describe the different types of tooling required for CNC.

Select tooling required for specific job on: CNC mill.

Write and manually input program data.

Production & maintenance Engineering Programs

CNC Programming basic using Fanuc

COURSE CONTENTS:

- Introduction
- Programming data
- Machine motion Axes
- Preparatory functions
- Miscellaneous functions
- Simple programming
- Angular and contour programming
-

TARGET PARTICIPANTS:

All persons who are responsible for production planning on the enterprise level or on operational levels.

LOCATION:

DURATION: 36 hours

DATE:

COURSE OBJECTIVES:

An introduction of computer numerical control (CNC) practices using Sinumerik. Includes the use of the Cartesian coordinate system, programming codes and command, and tooling requirements.

Student Learning Outcomes: (Competences)

Operate the machine tool safely.

Describe procedures for CNC machine start-up.

Explain safety requirements.

List and describe commands for CNC machine codes.

List and describe the purpose or function of the preparatory commands for a CNC machine (G-codes).

List and describe the purpose or function of the miscellaneous commands used with a CNC machine (M-codes).

Describe and select tooling for CNC operations to project specifications.

Describe the different types of tooling required for CNC mills.

Select tooling required for specific job on: CNC mill.

Write and manually input program data.

Execute programs for CNC mill

according to project specifications.

Explain the safety requirements.

Production & maintenance Engineering Programs

CNC Programming basic using Sinumerik

COURSE CONTENTS:

- Introduction
- Simple programming
- Angular ad contour programming
- Machine construction parts
- Panel parts an operations
- select tooling for CNC operations
- Adjust program zero
- Execute programs for CNC mill, CNC lathe

LOCATION:

DURATION: 15 hours

DATE:

CNC Programming basic using Sinumerik

COURSE OBJECTIVES:

The course is aiming to provide the engineers with understanding of developing the CNC programs for implementing automated machining along with modeling and design in CAM software like PowerMill. PowerMill when used in conjunction with CAD software like PowerShape can be used to design and model complex parts also, like Molds, Casts and Dies. PowerShape is tightly integrated with PowerMill, so understanding PowerMill will give an upper hand when learning PowerShape.

Student Learning Outcomes: (Competences)

Understand the user interface

Deal with the neutral data file; import CAD file.

Create the tool path

Edit the tool path

Simulate the tool path

Export the tool path

COURSE CONTENTS:

- Understand the user interface
- Import a CAD model
- Define stock
- Create tools
- Calculate high quality toolpaths
- Semi-finishing and finishing
- Make toolpath edits
- Simulate toolpaths
- Export NC code
- Save projects

LOCATION:

DURATION: 15 hours

DATE:

Production & maintenance Engineering Programs

Design and manufacture of plastic injection molds with inspection of molds and detection of defects

COURSE Content:

- 1 -Introduction to plastic injection process
- Scope of products
- Machine injection moldin
- Process injection molding
- Plastic materials
- Molds plates , plates and hit runner
- 2- Design concepts
- Reverse engineering
- New product with design from scratch
- Product material PA and Samsung as examples (material data sheet)“
- uniformity of pre-designed wall thickness”
- Number of cavities design
- make pressure balance to ensure mold long life"
- Draft angle cores and cavities according to material shrinkage and product depth as well as its thickness
- Simplify the shape to avoid slides and sink marks
- Avoid sharp edges to ease material flow and holes
- Reasonable tolerances suitable for the process part design
- Knowing the future use of the product, if it needs farther finishing process
- Sprues gates runners and vents
- Mold material

- Maintenance
- Long life of the molds depends on required pieces quantities
- Thermal design to decrease cycle time and to solve injection problem
- Part injection point and injection
- Guide pins locating
- Manufacturing methods and tools
- Ejectors (pins plates and rings. Mechanical or air injection molding guide
- Trouble shooting