

## 17.2.0 INDUSTRIAL ORGANISATION AND MANAGEMENT

### 17.2.1 Introduction

This module unit is designed to equip the trainee with the knowledge skills and attitudes for organisational management for technical operators and subsequently managers of the industrial plant production and manufacturing services. The purpose of the module unit is to equip the trainee with skills of the human and material resources management to enhance productivity in the mechanical production and services industry.

Trainees undertaking this module will require knowledge of communication skills and Mathematics (statistics).

### 17.2.2 General Objectives

By the end of the module unit, the trainee should be able to:

- a) understand the theories of management
- b) apply management skills in his/her field
- c) manage the human resources appropriately to maximize production
- d) plan and control the production processes
- e) acquire the knowledge of procurement, storing and costing of a product
- f) demonstrate innovation in design and development of industrial production

### 17.2.3 Module Summary and Time Allocation

#### INDUSTRIAL ORGANIZATION AND MANAGEMENT

Code	Sub-Module Unit	Contents	Time Hrs
17.2.01	Management Theory	<ul style="list-style-type: none"><li>• Theories of management</li><li>• Modern influences on the work of pioneers of management</li><li>• Contributions of management theories in modern day organisation management</li></ul>	6
17.2.02	Organisation Structures	<ul style="list-style-type: none"><li>• Theories of organisation</li><li>• Types of organisation structures and charts</li></ul>	4

		<ul style="list-style-type: none"> <li>• Need for delegation in organisation</li> <li>• Problems associated with delegation</li> <li>• Authority and responsibility</li> <li>• Decision process in organisation</li> <li>• Concept of management by objectives (MBO)</li> </ul>	
17.2.03	Plant Maintenance	<ul style="list-style-type: none"> <li>• Functions of maintenance department</li> <li>• Types of maintenance</li> <li>• Factors affecting plant reliability</li> <li>• Procedure of setting up maintenance schedule / plan</li> <li>• Centralized and decentralized maintenance</li> </ul>	4
17.2.04	Material Procurement and Stores Control	<ul style="list-style-type: none"> <li>• Meaning of procurement</li> <li>• Methods of procurement</li> <li>• Role of Public Procurement and Disposal Act in an organisation</li> <li>• Stores procedure</li> <li>• Methods of stock control</li> <li>• Types of stores</li> <li>• Stores documents</li> <li>• Stock control levels</li> </ul>	4
17.2.05	Production Planning Control	<ul style="list-style-type: none"> <li>• Functions / objectives of production planning</li> <li>• Factors affecting production</li> <li>• Need for product design</li> <li>• Stages of product design and development</li> <li>• Objectives of production control</li> <li>• Activities of production control</li> </ul>	4
17.2.06	Work Study	<ul style="list-style-type: none"> <li>• Objectives of work study</li> <li>• Limitations of work study</li> <li>• Phases of work study</li> <li>• Method study</li> </ul>	4

		<ul style="list-style-type: none"> <li>• Work measurement</li> <li>• Techniques of work measurement</li> <li>• Motion study</li> </ul>	
17.2.07	Human Resource Management	<ul style="list-style-type: none"> <li>• Functions of human resource manager</li> <li>• Need for staff recruitment in organisation</li> <li>• Sources of staff recruitment</li> <li>• Process of staff recruitment</li> <li>• Objectives of staff training</li> <li>• Staff training methods</li> <li>• Staff appraisal</li> <li>• Methods of staff appraisal</li> </ul>	4
17.2.08	Economics	<ul style="list-style-type: none"> <li>• Economics and engineering</li> <li>• Factors of production</li> <li>• Scarce resources and decision making</li> <li>• Opportunity cost</li> <li>• Production possibility curve (frontier)</li> </ul>	4
17.2.09	Office Administration	<ul style="list-style-type: none"> <li>• Functions of an office</li> <li>• Types of office layout</li> <li>• How an office can be organized</li> <li>• Types of filing</li> <li>• Methods of filing</li> <li>• Office equipment</li> </ul>	4
17.2.10	Estimating and Costing	<ul style="list-style-type: none"> <li>• Elements of cost</li> <li>• Cost structure</li> <li>• Unit cost</li> <li>• Marginal costing</li> </ul>	6
<b>Total</b>			<b>44</b>

<p><b>17.2.01</b>     <b>MANAGEMENT</b></p> <p><b>Theory</b></p> <p><b>17.2.01T0</b>    <i>Specific Objectives</i> By the end of the sub-module unit, the trainee should be able to:</p> <p>a) describe the theories of management</p> <p>b) explain the work of pioneers of management</p> <p>c) identify contribution of management theories in modern day management</p> <p>17.2.01C     <i>Competence</i> The trainee should have the ability to apply the theories of management in managing an industrial plant</p> <p>17.2.01T1    <i>Content</i> Theories of management</p> <ul style="list-style-type: none"> <li>- Classical theory</li> <li>- Scientific theory</li> <li>- Bureaucratic theory</li> <li>- Administrative theory</li> <li>- Human relations theory</li> <li>- Behavioural theory</li> </ul> <p>17.2.01T2    <i>Operational research</i> Pioneers of management</p>	<p>17.2.01T3    <i>Contribution of management theories in modern day management</i></p> <p><i>Suggested Learning Resources</i></p> <ul style="list-style-type: none"> <li>-Reference books</li> <li>-Charts</li> </ul> <p><b>17.2.2</b>     <b>ORGANIZATION STRUCTURES</b></p> <p><b>Theory</b></p> <p>17.2.2T0    <i>Specific Objectives</i> By the end of the sub-module unit, the trainee should be able to:</p> <p>a) explain various theories of organisation</p> <p>b) identify various types of organisation structures</p> <p>c) differentiate between authority and responsibility</p> <p>d) explain the problems associated with delegation</p> <p>e) describe the decision making process</p> <p>f) explain the concepts of management by objectives (MBO)</p> <p>17.2.02C    <i>Competence</i></p>
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	prepare maintenance schedule for the plant		<ul style="list-style-type: none"> <li>- Material resources</li> <li>- Job cards</li> <li>- Work order</li> <li>- Work request</li> <li>- Work study</li> <li>- Planning charts</li> <li>- Safety</li> </ul>
	<i>Content</i>		
17.2.03T1	Functions of plant maintenance department		
	<ul style="list-style-type: none"> <li>- Installation</li> <li>- Modification</li> <li>- Efficient management</li> <li>- Equipment appraisal</li> </ul>	17.2.03T4	Factors affecting plant reliability
17.2.03T2	Types of plant maintenance		<ul style="list-style-type: none"> <li>- Plant design</li> <li>- Maintenance</li> <li>- Optimum use of resources</li> </ul>
	<ul style="list-style-type: none"> <li>- Planned maintenance</li> <li>- Preventive</li> <li>- Corrective</li> <li>- Running</li> <li>- Shut down</li> <li>- Unplanned <ul style="list-style-type: none"> <li>o Emergency breakdown</li> </ul> </li> <li>- Centralized maintenance</li> <li>- Decentralized maintenance</li> <li>- Advantages and limitations of centralized and decentralized maintenance</li> <li>- Condition based</li> <li>- Predictive maintenance</li> </ul>	17.2.03T5	Centralized and decentralized maintenance
			<i>Suggested Learning Resources</i>
			<ul style="list-style-type: none"> <li>- Reference books</li> <li>- Charts</li> <li>- Sample of maintenance schedule</li> <li>- Job cards</li> <li>- Work order</li> <li>- Work request</li> <li>- Work study</li> <li>- Planning charts</li> </ul>
		<b>17.2.04</b>	<b>MATERIALS PROCUREMENT AND STORES CONTROL</b>
			<b>Theory</b>
17.2.03T3	Procedures of setting up maintenance plan		
	<ul style="list-style-type: none"> <li>- Inventory</li> <li>- Maintenance</li> <li>- Programme</li> <li>- Production schedules</li> </ul>	17.2.04T0	<i>Specific Objectives</i>
			By the end of the sub-module unit, the trainee should be able to:
			a) explain term procurement

	<ul style="list-style-type: none"> <li>b) explain procurement procedure</li> <li>c) describe the stores procedure</li> <li>d) describe documents used in store keeping</li> <li>e) determine the stock levels</li> <li>f) describe various types of stores</li> </ul>		<ul style="list-style-type: none"> <li>- Bin cards</li> <li>- Stores ledger</li> <li>- Computer based systems</li> </ul>
		17.2.04T5	Calculate stock levels <ul style="list-style-type: none"> <li>- Maximum stock level</li> <li>- Minimum stock level</li> <li>- Re-order level</li> <li>- Economic order quantity (EOQ)</li> </ul>
17.2.04C	<b>Competence</b> The trainee should have the ability to maintain optimum stock levels for production process	17.2.04T6	Types of stores <ul style="list-style-type: none"> <li>- Centralized store</li> <li>- Decentralized stores</li> </ul>
	<b>Content</b> 17.2.04T1 Meaning of procurement 17.2.04T2 Procurement procedure <ul style="list-style-type: none"> <li>- Quotation</li> <li>- Tendering</li> <li>- Spot purchase</li> <li>- Contract</li> <li>- Role of Public Procurement and Disposal Act in an organisation</li> </ul>		<b>Suggested Learning Resources</b> <ul style="list-style-type: none"> <li>- Store documents               <ul style="list-style-type: none"> <li>o Bin cards</li> <li>o Stores ledger</li> <li>o stock card</li> </ul> </li> <li>- Public Procurement and Disposal Act documents</li> </ul>
17.2.04T3	Store procedure <ul style="list-style-type: none"> <li>- Receiving</li> <li>- Storing</li> <li>- Requisition</li> <li>- Issuing               <ul style="list-style-type: none"> <li>o LIFO</li> <li>o FIFO</li> <li>o FILO</li> </ul> </li> </ul>		
17.2.04T4	Documents used in store keeping <ul style="list-style-type: none"> <li>- Stock record card</li> </ul>		
		<b>17.2.05</b>	<b>PRODUCTION PLANNING CONTROL</b>
			<b>Theory</b>
		17.2.05T0	<b>Specific Objectives</b> By the end of the sub-module unit, the trainee should be able to: <ul style="list-style-type: none"> <li>a) explain the function of production planning</li> </ul>

	b) explain factors affecting production planning		- Making production schedules
	c) describe methods of production	17.2.05T2	Factors affecting planning
	d) describe the need for product design		- Environmental
	e) describe stages of product design and development		- Political
	f) explain the objectives of production control	17.2.05T3	- Legal
	g) describe the activities of production control		- Socio-economic
			- Technological
		17.2.05T4	Methods of production
			- Jobbing
			- Batch
			- Flow
			- Mass
			- Process
17.2.05C	<i>Competence</i> The trainee should have the ability to plan a properly coordinated production process		Need for product design
			- Optimization of material resources
			- Optimization of manufacturing process
			- Reduction of cost
			- Standardization
17.2.05T1	<i>Content</i> Functions of production planning		- Specialization
	- Selection of process		- Simplification
	- A breakdown of parts	17.2.05T5	- Marketing requirements
	- Decision to produce or purchase		Stages of product design and development
	- Planning the machines, equipment and tools		- Idea generation
	- Development of machine operations		- Preliminary design and sketches
	- Development of time standard		- Analysis of design
	- Routing	17.2.05T6	- Evaluation
			- Functional design
			- Final design
			- Prototyping
			- Production design
			Objectives of production control



	<ul style="list-style-type: none"> <li>- Prime purpose</li> <li>- Minimizing idleness of machines and man</li> <li>- Meeting promises to customer</li> <li>- Inventory turnover</li> <li>- Quality of the product</li> </ul>		<ul style="list-style-type: none"> <li>d) explain the objectives of method study</li> <li>e) describe the techniques used in work measurements</li> </ul>
17.2.05T7	<p>Activities of production control</p> <ul style="list-style-type: none"> <li>- Routing</li> <li>- Scheduling</li> <li>- Follow-up</li> <li>- Processing</li> <li>- Dispatching</li> <li>- Programming</li> </ul>	17.2.06C	<p><i>Competence</i> The trainee should have the ability to calculate standard times and determine the duration of a given task at minimum cost</p>
	<p><i>Suggested Learning Resources</i></p> <ul style="list-style-type: none"> <li>- Charts</li> <li>- Model</li> <li>- Prototypes</li> </ul>	17.2.06T1	<p><i>Content</i> Objectives of work study</p> <ul style="list-style-type: none"> <li>- Productivity</li> <li>- Cost reduction</li> <li>- Methods of production</li> <li>- Time</li> </ul>
<b>17.2.06</b>	<b>WORK STUDY</b>	17.2.06T2	<p>Limitations of work study</p> <ul style="list-style-type: none"> <li>- Physical facilities</li> <li>- Workers resistance/resentment</li> </ul>
	<b>Theory</b>		
17.2.06T0	<p><i>Specific Objectives</i> By the end of the sub-module unit trainees should be able to:</p> <ul style="list-style-type: none"> <li>a) explain the basic concept of work study</li> <li>b) describe the conditions limiting the utilization of work study</li> <li>c) explain the phases of work-study</li> </ul>	17.2.06T3	<p>Phases of work study</p> <ul style="list-style-type: none"> <li>- Method study</li> <li>- works measurement</li> </ul>
		17.2.06T4	<p>Objectives of method study</p> <ul style="list-style-type: none"> <li>- efficiency</li> <li>- optimum utilization of resources</li> <li>- personnel and equipment</li> <li>- cost effectiveness</li> </ul>

17.2.06T5	<p>Techniques of work measurement</p> <ul style="list-style-type: none"> <li>- time</li> <li>- activity</li> <li>- sampling</li> <li>- synthesis</li> <li>- analytical estimating</li> <li>- PMTS (predetermined motion time systems)</li> </ul> <p><i>Suggested Learning Resources</i></p> <ul style="list-style-type: none"> <li>- Flow chart diagrams</li> <li>- Reference work/text books</li> </ul>	<ul style="list-style-type: none"> <li>f) describe the methods of staff training</li> <li>g) describe the objectives of staff appraisal</li> <li>h) describe the methods of staff appraisal</li> </ul>
		17.2.07C
		<p><i>Competence</i></p> <p>The trainee should have the ability to supervise work and assign appropriate tasks to the personnel</p>
		17.2.07T1
		<p><i>Content</i></p> <p>Functions of HR manager</p> <ul style="list-style-type: none"> <li>- Training</li> <li>- Recruitment</li> <li>- Wages</li> <li>- Salary</li> <li>- Welfare</li> <li>- Health</li> <li>- Safety</li> <li>- Industrial dispute</li> <li>- Public relations</li> <li>- Industrial relations and conflict resolution</li> </ul>
<b>17.2.07</b>	<b>HUMAN RESOURCE MANAGEMENT</b>	
	<b>Theory</b>	
17.2.07T0	<p><i>Specific Objectives</i></p> <p>By the end of the sub-module unit trainee should be able to:</p> <ul style="list-style-type: none"> <li>a) describe the functions of a HR manager</li> <li>b) describe the need for staff recruitment</li> <li>c) identify sources of labour in staff recruitment</li> <li>d) describe staff recruitment process</li> <li>e) describe the objectives of staff training</li> </ul>	17.2.07T2
		<p>Need for staff recruitment</p> <ul style="list-style-type: none"> <li>- Labour turn-over</li> <li>- New technology</li> <li>- Expansion</li> <li>- Production</li> <li>- Demand</li> <li>- Retirement</li> <li>- Replacement</li> </ul>
		17.2.07T3
		<p>Sources of labour</p> <ul style="list-style-type: none"> <li>- Internal</li> </ul>

17.2.07T4	<ul style="list-style-type: none"> <li>- External Staff recruitment process</li> <li>- Personnel specification</li> <li>- Job specification</li> <li>- Advertising</li> <li>- Short listing</li> <li>- Interviewing</li> <li>- Engagement</li> </ul>		<p><i>Suggested Learning Resources</i></p> <ul style="list-style-type: none"> <li>- Reference books</li> <li>- Charts</li> <li>- Employment Act document</li> </ul>
17.2.07T5	<p>Objectives of training staff</p> <ul style="list-style-type: none"> <li>- New technology</li> <li>- Retention</li> <li>- Personnel development</li> <li>- Organizational development</li> <li>- Motivation</li> </ul>	17.2.08T0	<p><b>17.2.08 ECONOMICS</b></p> <p><b>Theory</b></p> <p><i>Specific Objectives</i> By the end of the sub-module the trainee should be able to:</p> <ol style="list-style-type: none"> <li>a) describe the concept of economics</li> <li>b) describe the factors of production</li> <li>c) describe the relationship between scarce resources and decision making</li> </ol>
17.2.07T6	<p>Training methods</p> <ul style="list-style-type: none"> <li>- Vestibule</li> <li>- Induction</li> <li>- Seminars</li> <li>- External courses</li> <li>- Internal courses</li> <li>- On-the-job training</li> <li>- Apprenticeship</li> <li>- Workshops</li> <li>- Group training</li> <li>- Role playing</li> </ul>	17.2.08C	<p><i>Competence</i> The trainee should have the ability to utilize factors of production to realize profitability</p>
17.2.07T7	<p>Objectives of staff appraisal</p> <ul style="list-style-type: none"> <li>- Promotion</li> <li>- Training</li> <li>- Change of staff</li> </ul>		<p><i>Content</i></p>
17.2.07T8	<p>Methods of staff appraisal</p> <ul style="list-style-type: none"> <li>- Grading</li> <li>- Personnel specification</li> <li>- Job specification</li> </ul>	17.2.08T1	<p>Importance of economics in engineering</p> <ul style="list-style-type: none"> <li>- Wealth creation</li> <li>- Engineers are involvement in reduction of human effort</li> </ul>

17.2.08T2	Factors of production <ul style="list-style-type: none"> <li>- Labour</li> <li>- Land</li> <li>- Capital</li> <li>- Entrepreneurship</li> <li>- Market research</li> <li>- Geographical location</li> <li>- Politics</li> <li>- Statutory requirements</li> </ul>	<ul style="list-style-type: none"> <li>a) outline functions of office</li> <li>b) describe types of office layout</li> <li>c) describe types of filing</li> <li>d) explain how an office can be organized</li> <li>e) explain methods of filing</li> <li>f) identify and use office equipment</li> </ul>
17.2.08T3	Relationship between scarce resources and decision making <ul style="list-style-type: none"> <li>- Gross national product</li> <li>- Gross domestic product</li> <li>- National income</li> <li>- Market economy</li> <li>- Demand curves</li> <li>- Supply curves</li> <li>- Opportunity cost</li> </ul>	17.2.09C <i>Competence</i> The trainee should have the ability to manage an office and resources effectively
	<i>Suggested Learning Resources</i> <ul style="list-style-type: none"> <li>- Reference books</li> <li>- Charts</li> <li>- Statistics on national income from Government Agency</li> </ul>	17.2.09T1 <i>Content</i> Functions of office <ul style="list-style-type: none"> <li>- Coordination</li> <li>- Assignment of responsibilities</li> <li>- Conflict resolution</li> <li>- Quality control</li> <li>- Keeping organisation records</li> </ul>
<b>17.2.09</b>	<b>OFFICE ADMINISTRATION</b>	17.2.09T2
	<b>Theory</b>	17.2.09T3
17.2.09T0	<i>Specific Objectives</i> By the end of the sub-module the trainee should be able to:	17.2.09T4 how an office can be organized <ul style="list-style-type: none"> <li>- Routine tasks</li> <li>- Non-routine</li> <li>- Work schedule</li> <li>- Organization structure</li> </ul>

17.2.09T5	Methods of filing			
	- Alphabetical			
	- Geographical			
	- Numerical			
	- Chronological			
17.2.09T6	Identification and use of office equipment			
	<i>Suggested Learning Resources</i>			
	- Model office			
	- Office equipment			
	o telephone			
	o fax			
	o computers			
	o filing cabinets			
	o typewriters /teleprinter			
	o furniture			
		17.2.10C	<i>Competence</i>	c) calculate break-even point from the given data
				The trainee should have the ability to determine break-even point and the cost of producing a given component
			<i>Content</i>	
		17.2.10T1	Elements of cost	
			- Material cost	
			- Labour cost	
			- Expenses (direct and indirect)	
		17.2.10T2	Cost	
			- Prime cost	
			- Factory cost	
			- Manufacturing cost	
			- Total cost	
			- Marginal costing	
			- Fixed costs	
			- Variable costs	
			- Selling price	
			- Contribution towards fixed cost	
			- Loss zone	
			- Profit zone	
		17.2.10T3	Break-even point	
			- Plot	
<b>17.2.10</b>	<b>ESTIMATING AND COSTING</b>			
20.2.10T0	<i>Specific Objectives</i>			
	By the end of the sub-module the trainee should be able to:			
	a) describe elements of cost			
	b) determine the cost of a process or product			