Facilitator Guide

Sector
Life Sciences

Sub-Sector
Pharmaceutical, Biopharmaceutical

Occupation
Manufacturing

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NSQF level: 3
Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi
Prime Minister of India
Acknowledgement

Life Sciences Sector Skill Development Council would like to thank Life Sciences member company representatives for believing in our vision to enhance the employability of the aspiring workforce pool. LSSSDC facilitates this by developing and enabling the implementation of courses relevant to projected industry needs.

The aim is to address two key requirements, of closing the industry-academia skill gap, and of creating a talent pool that can reasonably meet current competitiveness requirements and weather future externalities in the Life Sciences Sector providing impetus to the Make in India program.

LSSSDC believes that this is an initiative of great importance for all stakeholders concerned – the industry, academia, and the aspirants. The tremendous amount of work and ceaseless support offered by the members of LSSSDC in developing a meaningful strategy for the content and design of program training materials has been truly commendable.

We would like to particularly thank Dr. Reddy’s Limited, Cadila Pharma Ltd., Glenmark Pharmaceutical Limited, Jubilant Generics Ltd.; Belco Pharma, Medicamen Biotech Pvt. Ltd. for bringing much needed focus to this effort.

CEO

LSSSDC
About this Guide

Life Sciences Sector is one of the primary engines of growth in the manufacturing space, and a leading player in the recently launched ‘Make in India’ campaign. With revenue in excess of $30 bn, Life Sciences sector has been growing at over 16% per annum in the past few years. The sector currently provides employment to around 800,000. The Manufacturing job roles, comprise around 384,000 (approx. 48% of the total job volume).

Life Sciences Sector Skill Council is aiming for skilling Fitter Mechanical ready with skills especially required for Life Sciences Sector. This Facilitator guide dovetails with the National Occupation Standards for Fitter Mechanical-Life Sciences, also developed by LSSSDC with Industry. The Manual will prove to be a vital tool in the skilling process. It will also be a boon for all fresh aspirants who wish to join the Life Sciences sector as Fitter Mechanical. It is designed to enable theoretical and practical skilling on Fitter Mechanical-Life Sciences Qualification Pack which mandates the below four Occupation Standards for the job role:

- LFS/N0260: Perform fitting and assembly operations on metal components
- LFS/N0261: Perform maintenance activities on mechanical equipment / machines
- LFS/N0204: Coordinate with shift supervisor, cross functional teams and within the team
- LFS/N0101: Maintain a healthy, safe and secure working environment in the life sciences facility

The above four occupational standards are covered under various units in the Facilitator guide which comprehensively binds knowledge and skills related to these.

The book is designed keeping in mind the minimum education qualification of Fitter Mechanical-Life Sciences to be 12th class Pass as stipulated by Industry. However, as part of this book, efforts have been made to put focus on practical learning in addition to all technical and manufacturing concepts required for the role. The Key Learning Objectives and the skills gained by the participant are defined in their respective units.

The contents of this book are in simple language. It is envisaged that this Facilitator guide will provide the participants with the knowledge and skills required for Job role of Fitter Mechanical-Life Sciences. It should enable participants to become effective and responsible Fitter Mechanical for Life Sciences Industry.

Symbols used in the book have been listed below.
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1. Introduction

Unit 1.1 - Life Sciences Industry and Drug Regulatory Authorities for Life Sciences Sector
Unit 1.2 - Standards for Manufacturing in Life Sciences
Unit 1.3 - Role of a Fitter in Industry
Key Learning Outcomes

At the end of the unit, you will be able to make the learners understand:

1. Life Sciences industry and its sub-sectors
2. Regulatory Authorities and Government policies, rules and regulations and their impact on manufacturing in Life Sciences industry in India and emerging markets
3. Standards for manufacturing in Life Sciences (cGMP and ISO)
4. Organization structure in Life Sciences industry (Large / Medium / Small Enterprises)
5. Typical manufacturing function in a Life Sciences organization
6. The job responsibilities of a fitter
UNIT 1.1: Life Sciences Industry and Drug Regulatory Authorities for Life Sciences Sector

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About Life Sciences Industry, its sub-sectors
2. Regulatory Authorities and how to follow the rules and regulations as they will understand their impact on manufacturing in Life Sciences industry in India

Activity

- Ask the students about the expectations from the course
- Invite students to participate. List their expectations on the whiteboard.
- Give the students a brief overview of what all will be covered in the program.

Do

- Divide the students in two groups.
- Call one from each group at a time and ask them to greet each other and introduce themselves to. each other in front of the class, this will be helpful in judging their interpersonal skills.
- Select students randomly and ask them about their hobbies, interests, goal, etc.

Ask

Ask the learners to share:

- Their idea about Life Sciences Industry in India, its sub-sectors in Life Sciences Industry.
- Basic knowledge and their views on Pharmaceuticals
- Their views on major Central Drugs Standard Control Organization
- Basic knowledge that they already know about Regulatory Authority and Government Policies
• Share facts and figures about Life Sciences Sector’s growth consistent and remarkable growth to the economic growth of the country.
• Provide an overview of Fitter Mechanical and the need for this job role in the sector.
• State the roles and responsibilities of Fitter Mechanical.
• Brief the learners about the huge demand for trained personnel nationally, in Life Sciences industry.
• State different segments of Life Sciences industry.

Notes for Facilitation
• Encourage shy students to provide information about themselves by prompting them with questions such as ‘what do you enjoy doing the most’, ‘what is your favourite movie or book’ etc.
• Appreciate students for their participation.
• Explain them required proficiency in communication in Life Sciences Industry.
• Discuss Contact Research.
• How to create a positive impression at the workplace.

Resources to be Used
• Available objects such as a duster, marker, white board, pen, notebook etc.

Elaborate

1.1.1 Introduction of Life Sciences Sector
The Indian Life Sciences industry currently tops the chart amongst the Indian industries. There is a huge range of science based industries with capacity of expanding in drug manufacture and technology sector. With recent advances in scientific knowledge and technological breakthrough discoveries, Life Sciences industry has gained the central platform with global giants and industry experts getting involved in research and development of new products.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 3 and explain the entire concept in detail to the learners.
1.1.2 Sub-Sectors in Life Sciences

The Life Sciences industry in India is diverse and encompasses pharmaceutical companies, biopharmaceutical companies and contract research organisations (CROs) along with specialist suppliers and support organisations.

1.1.2.1 Pharmaceuticals

The pharmaceutical industry designs, develops, produces, and markets drugs for use as medications.

There are many business verticals in pharmaceuticals Sub sector.

- Domestic Formulation companies: Formulation is the process that combines different chemical substances including the active drug in order to produce a final medicinal product.
- Export Oriented Formulation companies:
- API manufacturers:
- Contract manufacturing of formulations:

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 3-7 and explain the entire concept in detail to the learners.

1.1.2.2 Biopharmaceuticals

Biopharmaceutical business is engaged in discovering, developing and delivering innovative medicines to patients with serious diseases.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 8-11 and explain the entire concept in detail to the learners.

Program Overview

This program will facilitate an overview of:

- Lab Sciences Industry
- Prepare and maintain work area
- Maintain health and safety at workplace
- Create a positive impression at the workplace

Field Visit

- Take the students to Pharmaceutical industry, discuss Pharmaceutical industry with students.
Before leaving for the field visit, provide instructions to the learners about the following:

- Objectives of the field visit: what are they expected to learn during the field visit
- Guidelines on appropriate behavior and appearance for the field visit
- Importance of taking notes
- Logistics of the visit: Location, time, duration, transport facilities, etc.

After the learner comes back from the visit, have a joint experience sharing session to discuss what they learnt.

The trainer can conduct a Quiz to test the understanding of the learners as well as revise the main points of the course.

- Divide the learners into 3 teams.
- Ask each team to formulate at least 10 questions from the complete introductory module including.
- Conduct a QUIZ contest between the 3 teams, where one team asks questions on they made to the second team. The second team can earn a mutually agreed score if they get the answer correct. Then the second team asks questions on from the third team and then the third team will ask a question from the first.
- They can have 5-7 rounds.
- Any question that is not correctly answered will pass on to the next team.
- All questions and answers will be approved by the trainer.
- The trainer can also throw questions to the teams that are important but not covered by any of the teams.
- The trainer can ask one student to keep the score on the board.
- The winning team would get a standing ovation.

1. How many sub sectors are included in Life Sciences Sector?
   a. 4
   b. 6
   c. 3
   d. 4

2. What is the full name of Pharma Regulatory authority for India?
   a. Central Drug Substance Control Organization
   b. Central Drug Standards Control Organization
   c. Council for Drug Supplier and Cosmetic Organization
   d. Central Drug Standards Certification Organization
3. Which Schedule of Drug and Cosmetic Act specifies the guidelines for Good Manufacturing Practices involving premises and plants for Pharma and Bio Pharma Manufacturing in India?
   a. Schedule Y
   b. Schedule M
   c. Schedule D
   d. Schedule U
UNIT 1.2: Standards for Manufacturing in Life Sciences

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. Good Manufacturing Practices and their importance
2. Good Laboratory Practices and their importance
3. Pharmacopeia and use pharmacopeia and read monograph

Ask

The trainer should ask the questions about the following topics:
• What do they know about Life Sciences Manufacturing Standards

Say

• Discuss Good Manufacturing Practices.

Do

• Discuss Schedule M Compliance for Indian Manufacturer.
• Discuss ISO Standards applicable to Life Sciences Sector.

Resources to be used

• Available objects such as a duster, marker, white board, pen, notebook etc

Elaborate

1.2.1 Introduction of Life Sciences Manufacturing Standards

Drug manufacturing companies follow an international set of guidelines, ‘Good Manufacturing Practices (GMP)’ for production of medicines and vaccines in order to ensure the manufacturing of quality products. In recent years, more than 100 countries adopt and follow GMP protocols either in the form of regulations (Japan, Korea and United States), or Directives (European Union) or Guides (United Kingdom) or Codes (Australia).
1.2.1.1 Good Manufacturing Practices

The objective of Good Manufacturing Practices is to minimize risks with reference to the manufacturing, packaging, testing, labelling, distributing and importing of drugs, cosmetics, medical devices, blood and blood products, food items etc.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 13-15 and explain the entire concept in detail to the learners.

Demonstrate

- GMP Components

Elaborate

1.2.1.2 Schedule M Compliance for Indian Manufacturer

The manufacturing of medicinal products/ vaccines (drugs) in India is controlled under the Drugs and Cosmetics Rules (1945, last amended in 2005), which states that the holder of the license to manufacture drugs has to comply with the requirements of GMP as laid down in Schedule M.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 16 and explain the entire concept in detail to the learners.
1.2.1.3 ISO Standards applicable to Life Sciences Sector

The three ISO documentary standards that is particularly relevant to the life science industry:

- ISO 17025:2005: This standard sets out general requirements for ensuring the processes for making measurements are of high quality. This leads to accurate and precise readings (Clause 4) and the general guidelines for ensuring the proper training of people taking measurements (Clause 5).

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 16-17 and explain the entire concept in detail to the learners.

Activity

- Divide the class into three teams.
- Ask each team to take their turn and sit in a circle for a discussion on any one of the following topics.
  - Discuss Good Manufacturing Practices.
  - Discuss Basic principles for Good Manufacturing Practices.
  - Discuss ISO Standards to life Sciences Sector.
- Ensure that the other teams listen to any particular discussion and note down the key points. No team should choose the same topic.
- At the end of three rounds of discussion ask each team to suggest other teams' pointers that they may have missed while discussing on their chosen topic.
- The group making maximum genuine suggestions to others should be awarded as winner.

Exercise

1. What is Good Manufacturing Practices?

2. What is the objective of GMP?

3. What are the components of GMP?

4. What is Schedule M?
UNIT 1.3: Role of a Fitter in Industry

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. Role of Fitter in Industry
2. Personal attributes and knowledge requirements

Ask

Ask the learners to share:
- What do they know about the role of Fitter

Say

- Discuss job obligations of a Fitter.

Do

- List and explain the following personal requirements for a Fitter job:
  - Have practical skill
  - Be physically healthy
  - Enjoy specialized work
  - Have great dexterity
  - Be ready to work autonomously
  - Be ready to act as an element of a group
  - Have awareness to specifications
  - Possess typical hearing
  - Have no skin hypersensitivities
  - Be safety cognizant
Elaborate

1.3.1 Role of a fitter

Fitters are mechanical engineering tradespersons who have pooled their area of expertise in mechanical fitting and metal machining. A fitter fits and gathers parts and sub-congregations produced using metal and different materials to create production machinery and additional equipments.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 18 and explain the entire concept in detail to the learners.

1.3.2 Job obligations of a Fitter

• Examine point by point drawings or details to discover employment, material and equipment necessities.
• Lay’s out, positions, and secures parts and congregations as per details, utilizing straightedge, mix square, calipers, and ruler.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 18 and explain the entire concept in detail to the learners.

Activity

• Divide the class into 5 or 6 teams.
• Ask each team to pick any one or two job obligations of a fitter and share them with class, also ask students to add their views about how they can improve that specific obligation to increase their productivity, to make it easier or safer, make it more interesting etc.
• Ensure that the other teams listen to any particular discussion and note down the key points.
• Ensure all the job obligations of the fitter job role should be covered by the students only
• The team having the most interesting or knowledgeable views or story will be awarded as winner

Exercise

1. What does a Fitter do?
2. What are the Job obligations of a Fitter?
3. What are the personal requirements for a fitter job?
2. Occupational, Health and Safety (OHAS)

Unit 2.1- Learn Occupational Health & Safety
Unit 2.2- Hazards
Unit 2.3- Safe Working Practices
Unit 2.4- Personal Protective Equipment (PPE)
Unit 2.5- Safe Working at Heights
Unit 2.6- Safe Weight Lifting Practices
At the end of the unit, you will be able to make the learners understand:

1. About safety requirements, procedures and resources for different areas
2. About safe work practices
3. Hazards, types of hazards and how to control hazards
4. Common hazard signs
5. PPE requirements
6. Safe working practices at heights
7. About weight handling practices
UNIT 2.1: Learn Occupational Health and Safety

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About health and safety requirements in industry
2. Essential elements for safety
3. Good safety work practices

Ask

Ask the learners to share:

• Their views on Safety in workshop

Say

• Discuss essential elements necessary for Safety.

Do

• Discuss good safety practices.

Elaborate

2.1.1 Safety in workshop

The health, safety and protection of employees, equipment and the environment are of serious concern in workshops since capital goods is an industry of hazardous nature. The health and safety of employees is crucial since it affects both economic and social factors. It is necessary that workshop management recognizes the advantages of safe work environments and progressively adopt safety management practices to prevent hazardous events, avoid production and manpower losses and fall outs associated with the accidents.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 23-25 and explain the entire concept in detail to the learners.
2.1.2 Essential Elements Necessary for Safety

The following are the essential elements which are necessary for implementation of safety culture in a manufacturing plant.

- Safety consciousness is to be ingrained amongst the workforce as well as among the top management of the manufacturing plant.
- There is to be a communication plan and a participatory way of working from the maximum number of employees which will confirm that the commitment towards the safety is real.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 25 and explain the entire concept in detail to the learners.

2.1.3 Good Safety Practices

Good safety practices include the following:

- Assigning and publishing the responsibility and duties of the employees associated with the management of the safety in the workshop.
- Investigation of all the accidents whether small or big and the implementation of corrective measures.
- Studying the significant safety incidents which have happened in other workshops and learning from the same.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 26 and explain the entire concept in detail to the learners.

Activity

- Ask the students to write their name on a slip
- Collect the slips from the students fold them and put them on the table/box/bowl
- Randomly pick two slips and announce the name of students (the first student will ask question from the second student related to unit 2.1 and the second student will answer)
- Evaluate and explain the concept as per the learners’ performance

Exercise

1. What is Safety in Workshop?

2. What are the essential elements necessary for safety?

3. What are Good safety practices?
UNIT 2.2: Hazards

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About hazards and different types of hazards
2. How to identify and control hazards

Ask

Ask the learners to share:
• What do they know about Hazard

Say

• Define hazards.
• Explain the following hazards that occurs in pharmaceutical industry:
  » Physical hazards
  » Chemical hazards
  » Mechanical hazards
  » Electrical hazards
• Explain control measures.

Do

• Show the learners Hazard signs used in Pharmaceutical Industry:
  » Physical hazards warning sign

![Hazard Signs](image-url)
» Chemical hazards warning signs

» Mechanical hazard warning sign

» Electrical hazard

**Elaborate**

**2.2.1 Hazard**

A hazard is something that has the potential to cause injury, disease or death in a workplace. A slippery floor could result in someone falling and breaking an ankle.
There are a number of aspects to the development of a safe workplace environment:

- the development of policies
- the development of consultative processes

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 27 and explain the entire concept in detail to the learners.

### 2.2.2 Hazards in pharmaceutical industry

- **Physical hazards**
  Dust, noise and vibrations are produced while unloading, preparation and handling operations of material.

- **Chemical hazards**
  Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 27-30 and explain the entire concept in detail to the learners.

---

**Demonstrate**

- **Common hazard signs in industry**

![Hazard Signs](image)
Elaborate

2.2.5 Control measures
To ensure the health and safety, you have to adopt following methods:

- According to instructions, safely carry out assigned tasks and duties and to follow with safety rules and codes of practice.
- If there is any doubt about safety precaution or unsafe practice, consult with the supervisor.
- Wear PPE all the time at workplace.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 31-32 and explain the entire concept in detail to the learners.

Activity

- Ask the students to create a poster on various hazard signs.
- Each student should at least mention three hazard signs.

Notes for Facilitation

- Encourage participants to ask questions so that they can clear their doubts (if any) on future job role.
- Help participants to complete all the tasks included in the participant manual.
- Provide feedback to the group as a whole as to its performance.
- Ensure you have all the material for the activity - exercise sheets, related reading, stationery, etc.
- Re-emphasize key points made and issues raised during the session.
- Allow participants to share and draw from their prior knowledge and experience, and link them to the learning taking place.
- Appreciate students for their participation.

Exercise

1. The establishment of a safe workplace is:
   a) Ethically and socially responsible
   b) Not cost effective
   c) A priority in all organizations
   d) Ethically and socially irresponsible
2. In a health and safety context, a hazard is:
   a) Anything with the potential to result in an injury or illness
   b) The likelihood of someone being injured in the workplace
   c) Anything that could result in a physical injury
   d) Anything that could result in a psychological injury

3. Once you have spotted a hazard you must:
   a) Report it to your boss
   b) Leave it as someone else will fix it eventually
   c) Bring your own toolbox to work and fix it yourself
   d) None of the above
UNIT 2.3: Safe Working Practices

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. Safe working practices
2. Clean room practices

Ask

Ask the learners to share:
- Their views on safe working practices
- Their views on importance of clean room practices

Say

Explain in detail the following safe working practices:
- Safe practices for avoiding general shop hazards
- Safe practices for avoiding machine hazards

Do

- Discuss about Lockout & Tagout Procedure (LOTO Process) and explain the following:
  » Locking out of equipment
  » ‘Danger’ and ‘Out of Service’ tags
- Discuss clean room practices.
- List and brief the learners about the sources of contamination:
  » Facilities
  » People
  » Tool generated
  » Fluids
  » Product generated
• Explain in detail the following key elements of contamination control:
  » HEPA (High Efficiency Particulate Air Filter)
  » Cleanroom Architecture
  » Filtration
  » Cleaning
  » Cleanroom Garments
  » Human in Cleanrooms
  » Commodities
  » Cosmetics
  » Electrostatic Discharge (ESD)

Activity

• Select students randomly and ask them to extempore the LOTO Process in the class.

Elaborate

2.3.1 Safe working practices
Safe practices for avoiding general shop hazards
• Don’t use pressurized air for removing chips and burrs from the machine.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 34 and explain the entire concept in detail to the learners.

Demonstrate

• Locking out of equipment
• ‘Danger’ and ‘out of service’ tags

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 35 and explain the entire concept in detail to the learners.

---

### Exercise

1. What are safe working practices?

2. What is LOTO Process?

3. List any five sources of contamination.

4. List any two elements of contamination control.

---
UNIT 2.4: Personal Protective Equipment

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About PPE
2. Different types of PPE
3. Usage of PPE
4. How to use PPE

Ask

Ask the learners to share:

• What do they know about Personal Protective Equipment

Say

• Discuss with the learners about Personal Protective Equipment.
• List potential eye or face injuries.
• List the most commonly used equipment for eye and face protection:
  » Safety Spectacles
  » Goggles
  » Welding shields

Do

• Discuss with the learners about Head protection.
• Define Foot protection and explain the circumstances in which an employee/staff should wear foot and leg protection.
**Explain**

- Explain the learners about Hand protection.
- Explain Body protection.
- Discuss Ear protection.
- List some of the other safety instruments.

**Demonstrate**

- Personal Protective Equipment
- Safety goggles for Eye protection
• Safety Hat for Head protection

• Safety Boots for Foot/Leg protection

• Safety gloves for Hand protection
• Safety Dress for Body protection

• Ear Plugs for Ear protection

• Other safety instruments:
  » Respirator and safety belt
**Activity**

- Randomly pair the students.
- Ask them to identify Personal Protective Equipment by showing them one by one on the table.

**Resources to be used**

- Safety goggles
- Safety hat
- Safety boots
- Safety gloves
- Safety dress
- Ear plugs for ear protection
- Safety belt

**Elaborate**

### 2.4.1 Personal protective clothing

While working on shop floor every worker has to take care of several things about personal safety and also safety of its co-workers. To avoid certain accidents and hazards, person has to take different precautions for different situations. Firstly, on shop floor every person has to wear person protective equipment (PPE) for its personal safety.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 39 and explain the entire concept in detail to the learners.

### 2.4.1.1 Eye protection

Potential eye or face injuries include:

- Dust, dirt, metal or wood chips entering the eye from exercises, for example, chipping, grinding, sawing, hammering, and the utilization of power tools or even heavy wind force.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 40-44 and explain the entire concept in detail to the learners.
**Exercise**

1. The safe way of working is
   a. an effective and right way of working
   b. an ancient way of working
   c. a way of handling the work in a hurry
   d. a way of normal working

2. The best way of avoiding accident is by
   a. doing work in ancient way
   b. doing work in one’s own way
   c. observing safety rules related to job, machine and workplace
   d. using safety equipment

3. Employers have to provide a safe and healthy place for:
   a. Employees only
   b. Workers only
   c. Employees and Workers only
   d. Employees & Workers
UNIT 2.5: Safe Working at Heights

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. Risks of working at Heights
2. Safety precautions while working at Height

Ask

Ask the learners to share:
• Their views on Safe working at heights
• Idea of how important it is to follow safe working procedures while working at height

Say

• Explain the learners what is safe working at heights meant.
• List and the brief the learners about the following safe working procedures taken while working at heights:
  » Mobile elevated platforms
  » Scaffold towers
  » Safety lines, harness and nets
  » Ladders
  » Stepladders
  » Access equipment
• State Dos and Don’ts of working at height.

Demonstrate

• Mobile Elevated platforms
Activity

- Divide the learners into two teams and name the teams by team A and team B.
- Ask Team A to explain the dos of working at height.
- Ask Team B to explain the don’ts of working at height.
- Evaluate the performance and give feedback as per their performance.
- The winning team would get a standing ovation.

Elaborate

2.5.1 Safe working at heights

You have to done many activities at height. Ladders, scaffolds and platforms are examples of equipment used while working at height, but many more activities are there where you have to work at height with limited protection. These activities may lead to people and objects falling. The reason for this may be an insufficient protection while working.
2.5.1.1 Safe working practices at height

Safe working procedures or ways while working at heights:

1. Mobile elevated platforms

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 46-48 and explain the entire concept in detail to the learners.

2.5.1.2 Dos and don’ts of working at height

Dos

- Work on ground level, as much as possible.
- Make sure equipment is sufficiently stable, appropriate and strong for the job.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 48 and explain the entire concept in detail to the learners.

Notes for Facilitation

- Encourage participants to ask questions so that they can clear their doubts (if any) on future job role.
- Help participants to complete all the tasks included in the participant manual.
- Provide feedback to the group as a whole as to its performance.
- Ensure you have all the material for the activity - exercise sheets, related reading, stationery, etc.
- Re-emphasize key points made and issues raised during the session.
- Allow participants to share and draw from their prior knowledge and experience, and link them to the learning taking place.
- Appreciate students for their participation

Exercise

1. Define safe working at heights.

2. List any five safe working procedures one should take while working at height.

3. List the dos’ and don’ts of working at heights.
UNIT 2.6: Safe Weight Lifting Practices

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. Safe manual weight lifting practices
2. Identify heavy weight lifting equipment

Ask

Ask the learners to share:
• Their basic knowledge that they already know about Material lifting

Say

• Discuss Material lifting. List and brief the learners about the probable injuries that occur when one moves materials manually.

Demonstrate

• Wrong material handling injuries
Manual weight lifting steps

» Step 1: Look and plan, then move ahead. Ensure that there are no obstructions, slips and falls due to greasy and oily surface in your path.
» Step 2: Don’t lift too heavy load, more than your body strength.
» Step 3: Make good grip of hands on the load.
» Step 4: Stand over the object.
» Step 5: Balance your feet on surface, then move.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 51-52 and explain the entire concept in detail to the learners.

Do

- Brief the learners about Material handling equipment. List and explain the following handling equipment that helps in moving loads by eliminating the need to lift, lower or move the loads manually. These are:
  » Trucks
  » Forklifts
  » Dollies
  » Carts
  » Wheelbarrows
  » Hoists
Demonstrate

- Material handling equipment

Activity

- Randomly select students and ask them to ask a question to his/her partner regarding safe weight lifting practices.

Elaborate

2.6.1 Material lifting

Every worker has to lift and move heavy weight during the job whenever required. He may be required to move the job manually or by using forklift for lifting and moving.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 50-51 and explain the entire concept in detail to the learners.

2.6.1.2 Material handling equipment

Eliminate the need to lift or lower manually by using handling equipment that can assist you. Few types of equipment are:

- Trucks
- Forklifts
- Dollies

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 52 and explain the entire concept in detail to the learners.
Exercise

1. Material handling consists of movement of material from
   a. one machine to another
   b. one shop to another shop
   c. stores to shop
   d. all of the above

2. Fork lift truck is used for
   a. lifting and lowering
   b. vertical transportation
   c. both ‘a’ and ‘b’
   d. none of the above

3. Material handling consists of movement of material from
   a. one machine to another
   b. one shop to another shop
   c. stores to shop
   d. all of the above
3. 5S & House Keeping

Unit 3.1 - Housekeeping and Safety Issues in the Industry
Unit 3.2 - 5S Safety System
Unit 3.3 - Waste Disposal
Key Learning Outcomes

At the end of the unit, you will be able to make the learners understand:

1. Safety Issues at Workplace
2. 5S Safety Management System
3. About Housekeeping Facilities
4. Benefits of Housekeeping
5. Elements of Effective Housekeeping
6. Waste Management Practices
UNIT 3.1: Housekeeping and Safety Issues in the Industry

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. Safety Issues in the Industry
2. Housekeeping Issues in the Industry

Ask

Ask the learners to share:
- Their basic knowledge that they already know about Safety Issues in the Industry
- What do they know about Housekeeping Issues in the Industry

Say

- Explain the learners about Safety Issues in Workplace. And explain the following safety worries that may occur in any manufacturing setting. These are:
  » Hearing Protection
  » Eye hazards
  » Chemical Exposure
  » Mechanical Hazards
  » Fire Hazards
  » Carbon monoxide poisoning
  » Dust and fumes

Do

- Demonstrate the following for better understanding of the learners:
  » Eye Hazard
3.1.1 Safety Issues in Workplace

Uncovered wires, exhausted workers, poorly kept equipment. Manufacturing facilities are riddled with risks, both hidden and out in the open. Hazards can result in serious injury or death, if don’t know where to begin looking.

The biggest safety worries in any manufacturing setting are:

- Hearing Protection: Hearing can be affect by noise is produce by Industrial machines if you are uncovered to the noise on a long basis.
- Eye Hazards
- Chemical Exposure

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 57-59 and explain the entire concept in detail to the learners.
Activity

- Select learners randomly after the training session and ask them to extempore the following:
  - Hearing protection
  - Eye Hazards
  - Chemical Exposure
  - Mechanical Hazards
  - Fire Hazards
  - Carbon monoxide poisoning
  - Dust and fumes

Exercise

1. Explain any two safety worries of manufacturing settings:
   a. Hearing protection
   b. Eye hazards
   c. Chemical exposure
   d. Mechanical hazards
2. Explain dust and fumes.

............................................................................................................................................................................
UNIT 3.2: 5S Safety System

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About 5S Safety System
2. Essential Elements of Housekeeping
3. Good Housekeeping Practices

Ask

The trainer should ask the questions about the following:

- What is 5S Safety Management System
- What are the advantages of 5S

Say

- Explain the learners about 5S Safety Management System.
- State the Objectives of 5S.
- Discuss the Phrases of 5S.

Do

- List and explain the following advantages of 5S:
  - If equipment and tools are properly placed in organized work areas
  - Items can be visible very easily
  - It leads to greater workstation efficiency and mass production
  - To greater well-being and amplify motivation workplace should be clean and tidy
  - Time saving
  - Quick recovery
  - Minimization in mistakes & accidents
  - Increases workspace
  - Constant enhancement in work quality
  - Smooth working no obstruction
- Explain the 5S Audit, purpose for conducting regular 5S audit and its basic steps.
**Demonstrate**

- Demonstrate with the help of following chart 5S safety system.

![5S Safety System Diagram](image)

**Elaborate**

### 3.2.1 5S Safety management system

**What is 5S?**

5S is a fundamental, systematic, basic, approach for quality, productivity and safety improvement. 5S (Japanese Philosophy) is the name of a workplace organization procedure. 5S is created by a list of five Japanese words: seiri, seiton, seiso, seiketsu, and shitsuke. 5S system is implemented for organizing the workplace for increasing effectiveness and efficiency by maintaining the area and items, storing the items used, and sustaining the new practices.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 60-63 and explain the entire concept in detail to the learners.

**Explain**

- Discuss with the learners about Housekeeping Practices, its purpose and its benefits.

**Activity**

- Randomly select learners and ask them to ask a question to his/her partner regarding effective housekeeping practices.
3.2.2 Housekeeping practices

Workplaces hazards can be eliminated by effective housekeeping and by completing the job securely. Poor housekeeping and hiding hazards can cause frequent disasters which can cause injuries. Cleanliness doesn’t mean housekeeping.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 63-65 and explain the entire concept in detail to the learners.

Do

- List and explain in detail the following Elements of an Effective Housekeeping Program:
  - Dust and Dirt Removal
  - Surfaces
  - Maintain light fixtures
  - Spill control
  - Tools and equipment
  - Maintenance
  - Waste Disposal
  - Storage

Demonstrate

- Demonstrate the following elements of an effective housekeeping for better understanding of the learners:
  - Dust and Dirt removal
» Surfaces cleaning

» Slip warning sign

» Oil slip cleaning

» Storage of food
Exercise

1. Prepare a housekeeping checklist of your training center if housekeeping meets standard then sign (v) or not then sign (x). Also give your comments if not meeting standard

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Sign</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aisles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Well-marked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exits and entrances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Well-marked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Free of ice, snow, water, other obstructions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand and Portable Tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Properly stored when not in use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Fighting Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clearly marked</td>
<td></td>
<td></td>
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<tr>
<td>• Accessible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Well-drained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ladders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• In good condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Free of grease/oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Secure when in use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting</td>
<td></td>
<td></td>
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<tr>
<td>• Adequate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machines</td>
<td></td>
<td></td>
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<tr>
<td>• Clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• In good condition</td>
<td></td>
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<tr>
<td>Signs, Tags</td>
<td></td>
<td></td>
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<tr>
<td>• Adequate</td>
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<tr>
<td>• Appropriate</td>
<td></td>
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<tr>
<td>• Clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stacking and Storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Aisles clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stacks stable, secure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Well labelled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Area clean and clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Non-slip tread</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventilation System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste Disposal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Adequate number of bins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Separate and approved containers for oily rags, flammable scraps, etc</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
UNIT 3.3: Waste Disposal

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. What is Waste Management
2. Importance of Waste Management
3. Methods of Waste Management

Ask

Ask the learners to share:

• Their views about Waste Management
• Basic knowledge about Methods of Waste Management

Say

• Discuss with the learners about Waste Management and classification of wastes.

Do

• Explain the learners the elements of Waste Management Strategy.
• Discuss in detail the following methods of Waste Management:
  » Segregation
  » Composting
  » Burning
Demonstrate

- Waste Management

- Methods of Waste Management
  - Segregation

- Composting
3.3.1 Waste management

Waste management is gathering, transport, recycling, processing and disposal of waste materials. Waste management is carried by recovering resources from waste materials.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 70-71 and explain the entire concept in detail to the learners.

3.3.2 Elements of waste management strategy

Good waste management involve much more than ensuring that wastes are safely and legally disposed of. A typical strategy for the management of industrial waste might contain the following elements:

- Current waste management procedures and primary audit of wastes produced.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 71-72 and explain the entire concept in detail to the learners.
Exercise

1. Tripping over objects can be reduced by
   ............................................................................................................................................................................

2. Which is not the element of effective housekeeping?
   a. Waste disposal
   b. Cleaning
   c. Machining
   d. Spill control

3. Spilled oil can be the cause of an accident.
   a. True
   b. False

4. Which phase of 5S are you in when you clean machines, windows, floors etc.
   a. Sort
   b. Set-In-Order
   c. Shine
   d. Standardize

5. Which is not a benefit of Sort?
   a. Reduce the waste of searching
   b. Reduced set-up times
   c. Increased productivity
   d. Improved machine dependability
4. Fire Safety and Emergency Procedures

Unit 4.1 - Fire Safety Practices
Unit 4.2 - Use of Fire Extinguishers
Unit 4.3 - Emergency Procedures and Rescue Techniques
Unit 4.4 - First-aid Procedures
At the end of the unit, you will be able to make the learners understand:

1. About fire hazards
2. Fire safety practices
3. Usage of fire extinguisher
4. Emergency procedures
5. First aid procedures
UNIT 4.1: Fire Safety Practices

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About fire hazard
2. Types of fire
3. How to identify different firefighting equipment

Ask

Ask the learners to share:

- What do they know about fire hazard

Say

- Define fire hazard
- List and explain common ways of fire hazards

Elaborate

4.1.1 Fire hazard

- Fire is one of the most common causes of the accidents in establishments. Fire is defined as a self-sustaining combustion process in which a substance (fuel) combines with oxygen in air to produce immense heat and light. Life and properties are in danger due to fire hazards. Safety systems have a prime object which is fire hazards. These fire safety systems are used to sense or remove the danger of fire hazards.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 77 and explain the entire concept in detail to the learners.
Do

- State types of fire

Demonstrate

- Show the following chart for better understanding of the learners
  - Types of Fire

<table>
<thead>
<tr>
<th>Class of Fire</th>
<th>Description</th>
<th>Mode of Extinguishing</th>
<th>Medium of Extinguishing</th>
<th>Type of Extinguisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Fire involving solid material (fuel) for combustion like wood, paper, cloth, rubber and plastics that melt.</td>
<td>Cooling</td>
<td>Water</td>
<td>- Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Soda-Acid Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- CO₂ Gas type</td>
</tr>
<tr>
<td>B</td>
<td>Fire involving flammable liquids like petrol, diesel, thinners, cooking oils, paints, wax and plastics that melt.</td>
<td>Blanketing</td>
<td>Foam, CO₂, Halon, DCP</td>
<td>- Foam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- CO₂</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- DCP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Halon type</td>
</tr>
<tr>
<td>C</td>
<td>Fire caused by electricity or electric equipment</td>
<td>Cutting off electricity supply</td>
<td>Vaporising liquids, dry powder and CO₂</td>
<td>- CO₂</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- DCP</td>
</tr>
<tr>
<td>D</td>
<td>Fire involving flammable metals like magnesium, aluminium, titanium</td>
<td>Smothering</td>
<td>Suitable dry powder</td>
<td>- Special DCP extinguisher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Dry sand</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>- Powered Graphite</td>
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<td></td>
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<td></td>
<td>- Talc and Asbestos</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Limestone</td>
</tr>
</tbody>
</table>

Explain

- List and explain the following fire fighting equipment:
  - Fire Extinguisher
  - Smoke Detectors
  - Fire Alarm System
  - Fire Hydrants
Demonstrate

- Show the following fire fighting equipment for better understanding of the learners
  - Fire Extinguisher
  - Smoke detectors
  - Fire alarm
  - Fire hydrants

Activity

- Select students randomly after the training session and ask them to extempore on the types fire.
Exercise

1. Which of the following is not a fire fighting equipment:
   - a. Fire extinguisher
   - b. Smoke detector
   - c. Machining
   - d. Fire alarm system

2. What is Fire hazard?

3. What are the common ways of fire hazards?
UNIT 4.2: Use of Fire Extinguisher

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About fire extinguisher
2. Types of fire extinguisher
3. Usage of fire extinguisher

Ask

Ask the learners to share:
- Their knowledge about fire extinguishers

Say

- Define fire extinguisher and explain its following types:
  » Dry chemical
  » Foams
  » Water
  » Clean agents and carbon dioxide
- Explain the tips to be followed during fire outbreak.

Activity

- Select students randomly after the training session and ask them to extempore on the types of fire extinguisher.
4.2.1 Fire extinguishers

A fire extinguisher extinguishes or control fires. Nobody uses an out-of-control fire intentionally. To stop the out of control fire expertise of a fire department required.

Common fire extinguishers are:

- Dry chemical
- Foams
- Water
- Clean agents and carbon dioxide

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 80-81 and explain the entire concept in detail to the learners.

Steps for using a fire extinguisher

Step 1: Pull the pin from the top of the extinguisher for releasing locking mechanism which discharges the extinguisher.

Step 2: Aim the extinguisher at the base of the fire not the flame.

Step 3: Squeeze the lever slowly. Deliver the extinguishing agent in the extinguisher. When the lever of extinguisher is released, the discharge of extinguishing agent stops.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 81-82 and explain the entire concept in detail to the learners.
1. Fire is a combination of:
   a. fuel, light and oxygen
   b. fuel, heat and oxygen
   c. fuel, heat and carbon dioxide
   d. fuel, light and nitrogen

2. In case of electric fire, which one of the following should not use
   a. put water on it
   b. Use sand or clay
   c. Use C.T.C. extinguisher
   d. Use dry chemical powder

3. Which is the cause of electric fire
   a. Loose connection
   b. over loading the wires
   c. Electric short circuit
   d. All the above

4. carbonaceous fire is caused due to burning of wood or coal, to put off this fire use
   a. Soda acid extinguisher
   b. Sand or clay
   c. Water
   d. All the Above

5. If there is LPG leakage at home or workshop, what should u do
   a. Don’t switch on lights & fans
   b. Don’t switch off lights & fans
   c. Open the doors
   d. All the above
UNIT 4.3: Emergency Procedures and Rescue Techniques

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. Emergency procedures
2. Fire drills
3. How to rescue person in emergency

Ask

Ask the learners to share:

- What do they know about emergency procedures
- Their basic knowledge about fire drills

Say

- Explain emergency procedures in detail.
- Explain fire drills in detail.

Do

- Discuss about fire drills record.

Elaborate

4.3.1 Emergency procedures

Training of staff is required on emergency procedures, so that they can perform their duties and responsibilities during the emergency. Safety drills ensure that staff is able to perform their responsibilities and duties during any emergency securely and competently.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 84 and explain the entire concept in detail to the learners.
4.3.2 Fire drills

Conducting a Fire Drill Includes Exercising the Fire Plan:

a. For separation of fire
b. Evacuation of immediate area
c. Evacuation of smoke section
d. Prepare building and floors for mass departure
e. Extinguishment of fire

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 85-86 and explain the entire concept in detail to the learners.

Demonstrate

- Show the following sample of fire drill report for better understanding of the learners:
Correct method to move injured people and others during an emergency

To carry injured people to medical help or rescue from further harm. In these cases, you must consider the number of rescuers you have, the capabilities of these rescuers and the condition of the patient that must be stimulated. Below discussion on several ways to carry an injured person:

» Steps 1: Always stand on either side of the conscious patient. Grip the patient’s wrist with the hand closest to the patient’s feet on your side.

» Steps 2: To grasp the clothing on the shoulder nearest to you use your hand and pull the patient’s arms to support them to a sitting position.

» Steps 3: If possible place the arms around your shoulders and assist the victim to his or her feet.

» Steps 4: Put your free hand about the person’s waist and let him or her established the pace on hobbling out.

» Steps 5: Support the patient for moving slowly.

Activity

• Take a print out of the below given sample fire drill report sheet and distribute to all the learners.
• Ask students to fill it properly for their better understanding on how to fill the report.
Exercise

1. What are emergency procedure?

2. What are fire drills?

3. Explain the correct method to move injured and others during an emergency
UNIT 4.4: First aid procedures

Unit Objectives

At the end of this unit, you will be able to make the learners understand:

• Basic first aid techniques required during electric shock, burns and choking
• What is CPR process
• Bandaging process

Ask

Ask the learners to share:

• Their knowledge about first aid and are they aware of first aid techniques
• Basic knowledge that they already know about CPR process

Say

• Brief the learners about first aid, its varied techniques required during electric shock, burns and choking.
• Brief the learners about basic techniques required for bandaging.

Explain

• Explain the learners how to free a person from electrocution.
• Explain the learners first aid techniques required for treating the following:
  » Electric Shock
  » Bleeding and wounds
  » Burns
  » Choking
  » Poisoning
**Do**

- Discuss basic techniques of bandaging.
- Explain learners about artificial respiration and the CPR Process.

**Demonstrate**

- Demonstrate How to free a person from electrocution
  - Steps 1: If find someone is suffering from electric shock, approach with extreme caution and following first aid
  - Steps 2: Firstly, take the suffered person away from the electricity source as fast as possible. Turning off the electric supply of machine is the best method for doing this.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 88-89 and explain the entire concept in detail to the learners.

- How to provide first-aid in case of Shock
  - Cold, weakness, unbalanced breathing, rapid weak pulse, pale or bluish lips and fingernails and nausea are the symptoms of shock.
    - Steps 1: Don’t give anything for eating and drinking to victim.
    - Steps 2: Put down the victim on his/her back. Don’t move the victim if there’s any neck or back injury.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 89 and explain the entire concept in detail to the learners.

- Bleeding and Wounds
  - Steps 1: Cover the wound by a clean cloth and gloved hand; then apply firm and steady pressure on wound for 5 minutes at least.
  - Steps 2: Lift up the injured leg or arm above the victim’s heart level.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 89 and explain the entire concept in detail to the learners.

- Burns

- Chemical or Compressed Gas Burns
  - Steps 1: Use a drench hose and emergency shower for at least 15 minutes to rinse away all residues of chemicals.
  - Steps 2: Cover the burn by a clean and dry cloth or special dressing for burns.
  - Steps 3: Check person for shock.

- Heat or Electrical Burns
  - Steps 1: Cool burning of skin by water.
  - Steps 2: Place the burned area under cold running water if the skin is not broken and gently compress the wound by hand. Bandage the wound by a dry and clean cloth.
Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 90 and explain the entire concept in detail to the learners.

- **Choking**
  - Steps 1: Wrap your arms around the stomach and stand directly behind the victim.
  - Steps 2: Just above the navel and well below the ribs, make a fist by a hand. Place that fist with the thumb and forefinger side toward you.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 90-91 and explain the entire concept in detail to the learners.

- **Demonstrate basic techniques of bandaging**
  - Steps 1: Make sure the person is comfortable.
  - Steps 2: Never lean across their body always make sure you work from the side of the injury.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 91 and explain the entire concept in detail to the learners.

- **Demonstrate Artificial respiration and the CPR Process CPR Steps**
  - Steps 1: Hit and shout to get response from the Victim.
  - Steps 2: Minimum 30 times pump the chest – circulation.

- **CPR Process**

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 92 and explain the entire concept in detail to the learners.
Activity

- Select learners randomly and ask them explain any two of the following:
  - First aid technique during electric shock
  - First aid technique for Burns
  - First aid technique for bleeding and wounds
  - First aid technique for Choking

Exercise

1. What type of breathing protection do you use in a space with little oxygen?
   a. A disposable mask
   b. Self-contained breathing apparatus.
   c. A filter mask with the correct filter cartridge.
   d. None of these

2. The risk of manual task injuries are increased by
   a. The length of time spent handling the load
   b. Twisting sideways, bending and stretching
   c. Using trolleys and hoists
   d. Wearing a back brace

3. What is a frequent cause of stumbling, slipping or tripping?
   a. Failure to wear safety footwear.
   b. The lack of barrier tape along a footpath.
   c. The presence of cables and pipes lying across a footpath.
   d. None of these

4. Which one of these is NOT a symptom of carbon monoxide poisoning?
   a. Increasingly high levels of energy
   b. Nausea
   c. Slight to moderate headaches
   d. Impaired motor skills
5. Preparing for Machining, Fitting and Assembling Operation

Unit 5.1 – Limits, fits and tolerances
Unit 5.2 – Understanding the Engineering Drawings
Unit 5.3 – Equipment, Accessories and parts for Assembling
Unit 5.4 – Using of Measuring Instruments
At the end of this unit, you will be able to make the learners understand:
1. About limits, fits and tolerances
2. About Engineering drawings
3. How to identify fitting accessories
4. Usage of measuring instruments
5. How to calibrate instruments
UNIT 5.1: Safety including Hazards, Accidents, Safety Signs and Signals and Heinrich Pyramid

Unit Objectives

At the end of this unit, you will be able to make the learners understand:

1. Basic deviation, tolerance and tolerance grades
2. About transition fit, limits and system for limits and fits

Ask

Ask the learners to share:

- What do they know about Limits
- Their basic knowledge on terminology of limit systems

Say

- Define limits and explain the following terminologies of limit systems:
  » Limits of size
  » Nominal size
  » Basic size
  » Zero line
  » Deviation
  » Upper Deviation
  » Lower Deviation
  » Fundamental Deviation
  » Allowance

Do

- Define Fits and explain the following classes of fit:
  » Clearance
  » Interference
  » Transition fit
• Explain the standard system of limits and fits:
  » Hole Basis system
  » Shaft Basis System
• Define Tolerances and explain the following types of tolerances:
  » Unilateral tolerance
  » Bilateral tolerance

Demonstrate

• Limit system terminology

![Diagram of limit system terminology]

• Limits and fits system

![Diagram of limits and fits system]
• Fundamentals tolerances

• Schematic representation of tolerances

• Tolerance size
**Elaborate**

5.1.1 Limits

The most extreme and least permissible sizes inside which the actual size of a part lies are called Limits.

Terminology of limit systems:

- Limits of size: The two maximum allowable sizes of a part between which the actual size should lie including the maximum and least sizes of the part.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 97-98 and explain the entire concept in detail to the learners.

5.1.2 Fits

When two sections are to be collected, the connection resulting because of the difference between their sizes before assembly is known as a fit. A fit might be characterized as the level of tightness and detachment between two mating parts.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 98-99 and explain the entire concept in detail to the learners.

5.1.3 Tolerances

Tolerance is the difference between maximum limit of size and minimum limit of size. It characterizes the permissible or limits in size variation. It is constantly positive and articulated as a number.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 99-101 and explain the entire concept in detail to the learners.

**Exercise**

1. In standard system of limits and fits when hole size is kept constant and shaft size is varied, it is known as:
   a. Shaft basis system
   b. Constant System
   c. Hole basis system
   d. None of these

2. Tolerance is the difference between maximum and minimum limit of size.
   a. True
   b. False
3. In Indian Standards the number of fundamental deviations is:
   a. 30
   b. 25
   c. 14
   d. 5
UNIT 5.2: Understanding the Engineering Drawing

Unit Objectives

At the end of this unit, you will be able to make the learners understand:
1. Basics of engineering drawing
2. About Orthographic projection views
3. Concept of Quadrants
4. Engineering Standards
5. The tools required for engineering drawings

Ask

Ask the learners to share:
• Their knowledge about engineering drawing
• What do they know about orthographic projection

Say

• Discuss with the learners about engineering drawing and its presentation
• Explain the learners about Orthographic projection

Elaborate

5.2.1 Basic knowledge of engineering drawing

Engineering drawing: It is a graphical language utilized by specialists and other specialized faculty related with this profession.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 103 and explain the entire concept in detail to the learners.
5.2.1.1 Presentation of Engineering Drawing

In basic engineering drawing, orthographic projection method is used.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 104-106 and explain the entire concept in detail to the learners.

5.2.1.2 Orthographic projection

Orthographic drawings are the establishment of technical and machine drawings. These drawings generate complete data for development and repair, and in addition exhibit the object in its actual extents i.e. its size and shape.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 104-106 and explain the entire concept in detail to the learners.

Demonstrate

- Orthographic projection
  - Plane of projection
    - Slab view
» Different views of slab

» Orthographic views of a cylinder are

Do ✔️

• Explain the learners about the Concept of Quadrants.
• List and explain in detail the following tips for drawing the sketches:
  » Visualize Object
  » Determine Views
  » Determine Size
  » Locate Center Lines
  » Block in Main Outlines
  » Complete Detail
  » Dimension Lines Arrowheads
• Explain engineering drawing standards and define in detail the following:
Activity

- Ask the students to write their name on a slip.
- Collect the slips from the students fold them and put them on the table/box/bowl.
- Randomly pick two slips and announce the name of students (the first student will ask question from the second student related to unit 5.2 and the second student will answer).
- Evaluate and explain the concept as per the students’ performance.

Elaborate

5.2.1.3 Concept of Quadrants

- If we imagine the projection in 1st quadrant, then it is called 1st angle projection.
- If we imagine the projection in 2nd quadrant, then it is called 2nd angle projection.
- If we imagine the projection in 3rd quadrant, then it is called 3rd angle projection.
- If we imagine the projection in 4th quadrant, then it is called 4th angle projection.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 106-109 and explain the entire concept in detail to the learners.

5.2.1.4 Tips for drawing the sketches

A systematic order of application should be followed for both idea sketches and sketches from objects. It is outlined as follows:

Visualize Object: Visualize the definite and clear picture of object in mind, and then a decent graphical picture can be created.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 109-110 and explain the entire concept in detail to the learners.
5.2.2 Engineering Drawing Standards

Engineering drawings, being one of the many types of specialized form of exchanging information, need to satisfy some acknowledged guidelines.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 110 and explain the entire concept in detail to the learners.

5.2.2.1 Drawing Sheet Sizes

ISO most prescribed paper sizes for specialized drawings are known as A-FORMATS. Different arrangements, similar to the B-Series, are of lesser significance.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 110-111 and explain the entire concept in detail to the learners.

5.2.2.2 Lines

In technical drawings, various type of lines and line styles are used to provide the desired information. These lines differ in thickness and style.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 111-112 and explain the entire concept in detail to the learners.

5.2.2.3 Dimensioning

Through the usage of dimensions, the appropriate sizes of features are expressed. Distances might be shown with either of two accepted forms of dimension: ordinate and linear.

• In linear dimensioning, two parallel lines, also known as “extension lines,” separated at the distance between two components, which are shown at every element.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 112 and explain the entire concept in detail to the learners.
Demonstrate

- Drawing and drawing sheet sizes
  - Drawing sheet

- Drawing sheet sizes

<table>
<thead>
<tr>
<th>Designation</th>
<th>Size of the Sheet</th>
<th>Size of Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A (mm)</td>
<td>B (mm)</td>
</tr>
<tr>
<td>A0</td>
<td>841</td>
<td>1189</td>
</tr>
<tr>
<td>A1</td>
<td>594</td>
<td>841</td>
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<td>297</td>
</tr>
<tr>
<td>A5</td>
<td>184</td>
<td>210</td>
</tr>
</tbody>
</table>

- Lines

Part Outlines
Section Lines
Hidden Lines
Center Lines
Dimension and Extension Lines
Cutting Plane
Break Lines


**Exercise**

1. Draw the orthographic projections of the solid:

![Orthographic Projection](image)

2. In an orthographic projection, projectors are parallel to each other.
   a. True
   b. False

3. Pencils are specified on the European system using H, F and B. What does these stands for?
   a. H: ______________
   b. F: ______________
   c. B: ______________
UNIT 5.3: Equipments, accessories and parts for assembling

Unit Objectives

At the end of this unit, you will be able to make the learners understand:

1. Equipment require for assembling
2. Accessories require for assembling
3. Parts require for assembling

Ask

Ask the learners to share:
- What are the equipment required for assembling

Say

- List and explain the following equipment require for assembling:
  » Crowbars
  » Pull-lifts
  » Lubricated plates
- List and explain the following accessories require for assembling:
  » Wire rope slings
  » Chain sling
  » Shackles
  » Eye bolt
  » Hooks
  » Rings, links, swivels
- List and explain the following parts require for assembling:
  » Shafts
  » Bearings
  » Couplings
  » levers/linkages
» springs
» fabricated components
» chains
» keys
» belts
» pulleys
» gaskets
» seals
» sprockets
» gears
» pipework/hoses
» bushes
» cams and followers

Elaborate

5.3.1 Equipments require for assembling

1. Crowbars: A crowbar is a tool consisting of a metal bar with a solo arched end and flattened points, usually with a minute fissure on one or both ends for taking out nails. It is utilized as a lever to separate two things/objects or to take out nails. Crowbars are normally brought into play to release nailed wooden crates, remove nails, or pry apart boards.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 114-115 and explain the entire concept in detail to the learners.

5.3.2 Accessories require for assembling

Right lifting can move large objects proficiently and lessen labor-intensive operations. Wrong lifting be that as it may, can prompt unfortunate mishaps. Consistently, wrong lifting strategies cause wounds, loss of work time and property.

1. Wire rope slings: Wire rope comprises of individual wires laid into various strands, which are then wrapped around a focal center.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 115-130 and explain the entire concept in detail to the learners.
Demonstrate

- Demonstrate the steps for safe use of Slings:
  - Step 1: Prepare the arrival region ensuring the floor is sufficiently solid to take the load.
  - Step 2: Make sure the lifting point is over the focal point of gravity. Any loose parts of the load ought to be expelled or secured.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 115-130 and explain the entire concept in detail to the learners.

Activity

- Divide the students into two groups.
- Ask both the group to prepare multiple choice questions from unit 5.3 (minimum 5 ques from each group).
- Each group will then ask the question from the other group members in front of the class.
- Evaluate and give the feedback to students as per their explanations and performance.

Exercise

1. Gears are used to do the following for rotating shafts:
   a. increase speed
   b. decrease speed
   c. change direction of rotation
   d. all of the above
2. What type of bearing is meant to carry radial loads?
   a. journal
   b. ball
   c. thrust
   d. guide
3. What type of linkage is fixed at one end and is free to rotate 360 degrees?
   a. Crank
   b. Lever
   c. Rocker
   d. Bell
4. In wire rope, the purpose of a ‘filler wire’ is to do what?
   a. To strengthen the rope
   b. To keep the rope from unwinding when under load
   c. To increase flexibility
   d. To keep other wires in the strand in place

5. Which one of the following is NOT the function of bearing?
   a. Ensure free rotation of the shaft with minimum friction.
   b. Support the shaft and hold it in correct position.
   c. Take up forces that act on shaft and transmit them to the frame or foundation.
   d. Reduce centrifugal force of the shaft.
UNIT 5.4: Using of Measuring Instrument

Unit Objectives

At the end of this unit, you will be able to make the learners understand:

1. Different measuring instruments
2. How to use measuring instruments properly

Ask

Ask the learners to share:

• What do they know about measurement

Say

• Explain the learners in detail about Measurement
• Define measuring instruments and explain its following types:
  » Precision instruments
  » Non-precision instruments
  » Least count

Elaborate

5.4.1 Measurement

Measurement is the comparison of one quantity with standard quantity. Any measurement can be decided by the following values: level of estimation (which includes magnitude), measurements (units), and uncertainty.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 133-134 and explain the entire concept in detail to the learners.
5.4.2 Measuring instruments

A measuring instrument is a gadget for measuring a physical amount. In the physical sciences, quality confirmation and engineering, estimation is the movement of getting and contrasting physical amounts of certifiable items and events.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 134-135 and explain the entire concept in detail to the learners.

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Do

- Show and explain in detail the following measuring instruments:
  - Steel rule
  - Vernier caliper
  - Micrometer
  - Height gauge
  - Feeler gauge
  - Dial indicators
  - Bore gauge
  - Slip gauge
  - Thread gauge
  - Profile gauge
  - Coordinate measuring machine

---

Elaborate

5.4.2.1 Steel Rule

Steel Rule is a flat and thin linear measurement instrument. It is the most commonly used measuring instrument.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 135-146 and explain the entire concept in detail to the learners.
Demonstrate

- Steps for using and reading a Vernier caliper
  » Step 1: Loosen the locking screw and move the slider to check if the Vernier scale works properly and make sure the calliper reads 0 when fully closed. If the reading is not 0, adjust the calliper’s jaws until you get a 0 reading. If you can’t adjust the calliper to 0, remember to add to subtract the correct offset from your final reading.

  Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 135-146 and explain the entire concept in detail to the learners.

- Steps for setting the bore gauge to zero by micrometer
  » Step 1. Set a micrometer to the size bore you will be testing.
  » Step 2. Set up the dial bore gauge with the extensions necessary for the bore diameter.

  Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 141 and explain the entire concept in detail to the learners.

- Steps to use a dial gauge
  » Step 1. Zero the gauge: This is proficient by measuring across the gauge with an external micrometer set to the exact bore size. This is ready to use when the zero aligns with the needle.

  Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 141 and explain the entire concept in detail to the learners.

- The process of wringing
  » Step 1. Across an oiled pad wiping a clean gauge block.
  » Step 2. By the use of dry pad, wipe any extra oil on gauge block.

  Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 142 and explain the entire concept in detail to the learners.

- Steps to use profile gauge
  » Step 1. To use the gauge, start by first pressing the teeth against a flat surface until all of the ends are in line.

  Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 145 and explain the entire concept in detail to the learners.

Explain

- Explain calibration of measuring instruments and its process (calibration process).
Elaborate

5.4.3 Calibration of measuring instruments

Calibration includes establishing and documenting abnormality of the measured value from retraceable, extremely precise standards of inspection.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 147 and explain the entire concept in detail to the learners.

Exercise

1. Usually, the reading accuracy of steel rules is around 0.5 mm.
   a. True
   b. False

2. Precision is the degree under which repeated measurements under unchanged conditions show the same result.
   a. True
   b. False

3. What is the least count of a micrometer:
   a. 0.1 mm
   b. 0.01 mm
   c. 0.0001 mm
   d. None of these

4. What is the use of locking screw in a Vernier Calliper:
   a. To read measurement
   b. To tighten or loosen object held in the jaw
   c. To provide a level surface
   d. None of these

Activity

- Ask the students to write their name on a slip.
- Collect the slips from the students fold them and put them on the table/box/bowl.
- Randomly pick two slips and announce the name of students (the first student will ask question from the second student related to unit 5.4 and the second student will answer).
- Evaluate and explain the concept as per the students’ performance.
6. Marking out of components

Unit 6.1 - Marking out
Unit 6.2 - Marking out tools
Unit 6.3 - Marking out methods
Unit 6.4 - Marking out procedure
Key Learning Outcomes

At the end of this unit, you will be able to make the learners understand:

1. Basics of marking out
2. Identity of tools required for marking out
3. Methods of marking out
4. Procedure of marking out
UNIT 6.1: Marking out

Unit Objectives

At the end of this unit, you will be able to make the learners understand:

1. Basics of marking out
2. Methods of marking out

Ask

Ask the learners to share:

- Their basic knowledge that they already know about marking out

Say

- Brief the learners about marking out.

Do

- Discuss with the learners the purpose of marking-out.

Elaborate

6.1.1 Introduction

With all types of work, one of the first actions is setting out or marking the positions of components, whether they are fixed or to be fabricated. All details must be interpreted correctly and set out accurately. The equipment used for setting out will vary, depending on the size of the task.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 151-152 and explain the entire concept in detail to the learners.
Exercise

1. What is marking out?

2. The marking out is used to indicate:
   a. Cutting lines
   b. Folding lines
   c. Minimize material waste
   d. Hole positions
UNIT 6.2: Marking out tools

Unit Objectives

At the end of this unit, you will be able to make the learners understand:
1. Identity of marking out tools
2. How to use tools

Ask

Ask the learners to share:
• Their basic knowledge that they already know about marking out and its tools

Do

• Show and explain the learners following marking out tools and explain their uses:
  » Graduated steel rule
  » Tape rule
  » Engineers square
  » Combination square
  » Scriber
  » Center punch
  » Dividers
  » Marking or scratch gauge
  » Trammel points
  » Surface plate
  » Angle plate
  » Vee block
Elaborate

6.2.1.1 Graduated steel rule

It is utilized to measure lengths to a direct level of exactness. Graduations on the ruler are normally millimeters and half millimeters. To be precise, the rule must be in great condition with level, straight and genuine edges.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 153-158 and explain the entire concept in detail to the learners.
Exercise

1. This tool has a sharp metal point for marking on wood, metal and plastic:
   a. scribe
   b. center punch
   c. file
   d. cold chisel

2. This tool has a moveable handle angled at 45 degrees and 90 degrees:
   a. tri-square
   b. bevel protractor
   c. combination square
   d. bevel set

3. The tri-square, combination square, framing square and bevel set are all:
   a. marking tools
   b. measuring tools
   c. clamping tools
   d. finding tools

4. The tool, which is used for laying out large circle is:
   a. Trammel
   b. Divider
   c. Jenny caliper
   d. Scribe

5. Scribe is made of:
   a. copper
   b. High carbon steel
   c. Mild Steel
   d. Cast Iron
UNIT 6.3: Marking out Methods

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. Marking out methods
2. How to draw datum properly

Ask

Ask the learners to share:

- Their basic knowledge that they already know about marking out and its methods

Say

- Define Datum line method.
- Explain the following types of datum:
  - Point datum
  - Line datum
  - Edge datum

Demonstrate

- Datum line method

![Diagram of Datum line and mark]
6.3.1 Datum line method

The term datum can be described as a point, line or edge, depending on the shape of the work piece from which measurements are taken.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 159 and explain the entire concept in detail to the learners.

6.3.1.1 Types of datum

Point datum: This is a singly point from which measurements can be taken when allotting and marking out. For instance, the middle purpose of a pitch circle.

Line datum:
Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 159 and explain the entire concept in detail to the learners.
Do

- Explain the learners in detail marking out method

Elaborate

6.3.1 Marking out method

1. Marking Straight Lines When a straight line is necessary between two focuses, a law can be utilized or, for longer separations, a straight edge.

![Diagram of marking straight lines](image)

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 160-161 and explain the entire concept in detail to the learners.

Exercise

1. Which one of the following parts of a universal surface gauge helps to draw parallel lines along a datum edge?
   a. Fine adjusting screw
   b. Guide pins
   c. Base
   d. Rocker arm
2. A divider is used for
   a. scribing circles
   b. scribing arcs
   c. transferring and stepping of distance
   d. all of the above
3. The slots are provided on angle plate for
   a. accommodating bolts
   b. hanging with hooks
   c. reducing weight
   d. aligning the work

4. During marking. The reference surface is provided by
   a. Sketch of the job
   b. Workpiece
   c. Marking off table surface
   d. Surface gauge
UNIT 6.4: Marking out procedure

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. How to perform marking out procedure

Ask

Ask the learners to share:
• Their basic knowledge that they already know about marking out

Say

• Discuss with the learners the marking out procedure.
• Explain the following steps of marking out procedure:
  » Inspection
  » Layout dye
  » Marking out lines
  » Finally check
  » Permanent establishment of outlines

Activity

• Divide the class into groups and ask them to select any topic of their choice from the units 6.1, 6.2, 6.3 and 6.4 and present it in front of the class.
• Make sure no two groups have same topics so that all the topics of units 6.1, 6.2, 6.3 and 6.4 can be revised
6.4.1 Marking out procedure -Steps

- Step 1: Inspection
  Material should be inspected before use for:
  - edges not straight or square
  - cracks and surface defects

- Step 2: Layout dye
  Application of a coating substance can be used so that the marked lines will show clearly. The colour of the coating substance should be in contrast to the surface colour of the work.
  - For rough surfaces (such as those on black bar material), chalk rubbed in or water paint is commonly used.
  - For machined or finished surfaces, a blue marking out dye can be used.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 163-165 and explain the entire concept in detail to the learners.

Exercise

1. Explain the marking out procedure.

2. Which of the following is not a marking out line:
   a. Datum lines
   b. Centre lines
   c. Layout dye
   d. Outlines
7. Fitting Operations

Unit 7.1 - Filing
Unit 7.2 - Sawing
Unit 7.3 - Drilling and reaming
Unit 7.4 - Threading
Unit 7.5 - Grinding
Unit 7.6 - Work holding devices
Key Learning Outcomes

At the end of this unit, you will be able to make the learners understand:

1. About filing
2. How to perform sawing operation
3. How to perform drilling operation
4. How to perform reaming procedure
5. How to perform grinding operation
6. Work holding devices
UNIT 7.1: Filing

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About files
2. Features of files
3. How to use files properly

Ask

Ask the learners to share:
- What do they know about fitting operations
- Their basic knowledge that they already know about filing

Say

- Discuss about fitting operations.
- Discuss about files in detail.

Do

- Explain in detail the following types of files:
  » Hand File
  » Flat file
  » Half-round file
  » Round files
  » Square files
  » Three square files
  » Needle files
  » Triangular files
  » Knife files
Explain

- Explain the learners how to use a file.
- Explain storing and safety.

Elaborate

7.1.1 Fitting operations

The word fitting, is identified with gathering of parts, bringing the measurement or shape to the required size or frame, so as to secure the essential fit.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 169-172 and explain the entire concept in detail to the learners.

Demonstrate

- Parts of file

- Types of file cut
Activity

- Randomly pair the learners
- Ask them to identify file types by showing them one by one on the table.

Resources to be used

- Hand file
- Flat file
- Half-round file
- Round file
- Square file
- Three square file
- Needle file
- Triangular file
- Knife file
Elaborate

7.1.2.2 How to use a file

For ideal filing operation, make long and stable strokes with medium pressure at the rate of 35 to 45 strokes per minute. File can slip over the workpiece, if you put too light pressure and too high speed over it. For heavy filing, reduce the speed and raise the pressure.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 172-173 and explain the entire concept in detail to the learners.

7.1.2.3 Storing and Safety

Files are fine cutting tools. Keep them clean for make a good cut. Since they are tempered so hard, they are extremely weak and can be damaged very easily.

To care for file guarantee that you take after these rule

• Keep the file spotless and dry.
• Never twist or put very high pressure on file.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 173 and explain the entire concept in detail to the learners.

Exercise

1. List the key parts of file.

2. Define any two of the following files:
   a. Hand file
   b. Flat file
   c. Half-round file
   d. Round files

3. Define the following:
   a. Cross filing
   b. Draw filing
UNIT 7.2: Sawing

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About sawing
2. Features of hacksaw
3. How to use hacksaw properly

Ask

Ask the learners to share:

- What do they know about sawing
- Their basic knowledge that they already know about handsaw

Say

- Discuss about handsaw and explain its parts.

Elaborate

7.2.1 Handsaw

Handsaws are the most generally utilized hand tool in workshop.

Parts of a hacksaw: A good number hacksaw frames are adjustable so they can moved to get a number of special lengths of blades.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 174-175 and explain the entire concept in detail to the learners.
Demonstrate

- Demonstrate the steps for fitting the blade
  - Step 1: Set cutting blade at the right length;
  - Step 2: Check both pins are facing in similar direction;
  - Step 3: Grip the hacksaw handle in one hand and cutting blade front in other hand. Face the direction of teeth towards the front of frame;

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 175 and explain the entire concept in detail to the learners.

- Demonstrate the steps for cutting with a Hacksaw
  - Step 1: Holding the Hacksaw
    * Grip the hacksaw by both hands and always move it straight and upright.
    * Ensure that cutting blade will not bend or twist during the cutting stroke.
  - Step 2: Stance
    * Stand behind the bench vice in balanced position.
    * Keep the right hand near the body and forearm in line of the blade.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 175 and explain the entire concept in detail to the learners.

Exercise

1. Which methods belong to the shape cutting process?
   a. Filing
   b. Drilling
   c. Welding
   d. Soldering

2. What tooth forms can saw blades have?
   a. Curved tooth
   b. Blind tooth
   c. Union tooth
   d. Angular tooth

3. Which of the listed parts belong to a file?
   a. Tang
   b. Blade
   c. Handle
   d. Mantle
4. Cross filing is a method of:
   a. Producing a smooth surface
   b. Filling a metal with other material
   c. Removing metal
   d. None of these
UNIT 7.3: Drilling and Reaming

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About drilling operations
2. Types of drills
3. Reaming and types of reamers

Ask

Ask the learners to share:
- What do they know about Drilling
- Their basic knowledge that they already know about drilling machines

Say

- Define drilling and drilling machines.
- List the types of drilling machines.

Do

- Explain the following types of drilling machines:
  - Bench Drilling Machines
  - Pillar/Pedestal Drilling Machines
  - Radial Arm Drilling Machines
  - Portable Drills and its types: Pistol grip drills, Pistol grip with side handle, Angle head drills, Hammer drills.
7.3.1 Drilling

Drilling is the way toward cutting holes in metals by utilizing a Drilling machine. Drills are the instruments used to remove fine shavings of material as the drill progresses in a rotational movement through the material.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 178-180 and explain the entire concept in detail to the learners.

Demonstrate

- Types of drilling machines
  - Bench Drilling Machines
  - Pillar/Pedestal Drilling Machines
» Radial Arm Drilling Machines

» Types of Portable Drills
» Pistol Grip Drills

» Hammer
Discuss

• Discuss drill operating parameters.
• Discuss about the safety and care required on drilling.

Explain

• Define reaming and explain its functions.
• Explain the following types of reamers:
  » Hand reamer
  » Machine reamer
  » Expanding reamer/Adjustable reamer

Demonstrate

• Demonstrate the steps for operating drill
  » Step 1: Choose accurate drill bit;
  » Step 2: Use carbide tipped bits for drilling of brickwork, ceramic tile, concrete, sandstone and fibrous cement

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 181 and explain the entire concept in detail to the learners.

• Demonstrate the steps of reaming operation
  » Step 1. Care should be taken while handling sharp cutting edges.
  » Step 2. Reamers should be used for removing small amount of materials.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 182 and explain the entire concept in detail to the learners.

Elaborate

7.3.1.3 Drill Operating Parameters

These drills can be utilized for easy rotary activity and also only for hammering without rotation.
Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 180-182 and explain the entire concept in detail to the learners.

### Exercise

1. A cutting tool used to finish and enlarge a hole is known as
   a. Drill
   b. Tap
   c. Die
   d. Reamer

2. What does the feed rate depend on when drilling?
   a. Air pressure
   b. Clamping device
   c. Workpiece material
   d. Drill bit material

3. Which of the following cutting conditions greatly affects the tool wear?
   a. Cutting speed
   b. Feed
   c. Depth of cut
   d. None of the above

4. Which one of the following metals does not require any coolant during reaming:
   a. Aluminium
   b. Cast iron
   c. Copper
   d. Steel
5. A drilled hole goes out of centre due to:
   a. improper clamping of workpiece
   b. workpiece having blowholes
   c. centre punch mark not being large enough to give proper seat to the chisel edge of drill
   d. any one of the above
At the end of the unit, you will be able to make the learners understand:
1. About threading operations
2. About tapping
3. About stocking and dieing

Ask

Ask the learners to share:
- What do they know about threading and its process
- What do they know about tapping and its procedure

Say

• Define threading
• Define tapping and explain the following types of tapping:
  » Bottoming Tap or Plug Tap
  » Intermediate Tap or Second Tap
  » Taper Tap

Demonstrate

• Different types of taps
Do

- Discuss about Die.
- Explain the precautions and operation of Die.

Elaborate

7.4.3. Die

For cutting outer threads of round shape bars or tubes, dies can be used. Hardened high carbon steel or high speed steel is used to make dies.

1. Split Die or Button Die Split dies are placed in the stock.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 185-186 and explain the entire concept in detail to the learners.

7.4.3.1 Precautions and Operation of Die

- The diameter of blank rod has not to be bigger than the outside diameter of thread.
- Make sure that die is set at right angle to the rod.
Demonstrate

- Threading Process
  - Step 1. Check the diameter of rod. The blank diameter should be 0.1mm less than the pitch of the thread
  - Step 2. Correct size of die and die stock should be used
  - Step 3. The length of the threaded portion should be marked

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 186-187 and explain the entire concept in detail to the learners.

Exercise

1. What is threading?

2. What is tapping?

3. Explain any two of the following
   a. Bottoming Tap or Plug Tap
   b. Intermediate
UNIT 7.5: Grinding

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

1. About grinding
2. Different types of grinders
3. How to use grinders

Ask

Ask the learners to share:

- What do they know about grinding.

Say

- Discuss about hand grinding machines
- Show and explain in detail the following grinding machines:
  » Pedestal type
  » Bench type
  » Portable

Do

- Show and explain in detail the following features of grinding machines:
  » Work rests
  » Wheel guards
  » Wheel speed
  » Wheel rotation
7.5.1 Grinding

- Grinding is a finishing operation. Grinding is used to get required precision of form and accuracy by removing excess material from the work-piece. This process is done by means of a grinding machine. A grinding machine uses a grinding wheel that rotates at high speed to cut material.

7.5.1.1 Hand Grinding Machines

- There are numerous kinds of grinding machines used.
- The machines may be:
  - Pedestal type
  - Bench type
  - Portable

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 188-189 and explain the entire concept in detail to the learners.

7.5.1.2 Features of grinding Machines

1. Work Rests

   Portable grinders are utilized where it is difficult to work by pedestal grinder. It is used by hand and passing it over the work. Portable grinders are once in a while utilized for device sharpening. The trouble of acquiring consistent quality and inflexibility generally brings about poor complete and erroneous surfaces.

   Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 189-190 and explain the entire concept in detail to the learners.

Demonstrate

- Grinding machine operation
  - Grinders pre-operation checklist
    - Step 1. Always wear eye safeguard. (Protection glasses beneath a face shield).
    - Step 2. Remove ties, rings, watches and other gems. Long hair ought to be tied back and free sleeves ought not to be worn. Try not to wear gloves while using a buffing, granulating or cleaning wheel.
    - Step 3. Make beyond any doubt the wheel guards are set up and appropriately balanced and fixed.
Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 191 and explain the entire concept in detail to the learners.

» Operation
» Step 1. Stand to the other side of the wheel when turning on the power.
» Step 2. Before beginning grinding, permit the grinding wheel to keep running at working rate for no less than one minute.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 191 and explain the entire concept in detail to the learners.

Activity

• Select learners randomly and ask them to explain any one of the following features of grinding machines:
  » Work rests
  » Wheel guards
  » Wheel speed
  » Wheel rotation

Exercise

1. A cutting tool used to cut outside threads is called
   a. Drill
   b. Reamer
   c. Die
   d. Tap
2. What is used for removing a broken tap?
   a. Tap disposer
   b. Tap wrench
   c. Tap extractor
   d. Tap nut
3. Which process is grinding a part of?
   a. Joining process
   b. Printing process
   c. Chip-removing process
   d. Casting process
4. Which abrasive has the highest degree of hardness?
   a. Corundum
   b. Silicon carbide
   c. Boron nitride
   d. Diamond

5. What is not one of the working rules of tapping??
   a. Drill the core hole in the required size
   b. Ream the core hole to the exact dimension
   c. Countersink the core hole
   d. Use a suitable threading fluid
UNIT 7.6: Work Holding Devices

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About work holding devices
2. Different types of work holding devices
3. How to use work holding devices

Ask

Ask the learners to share:
• What do they know about workholding devices.

Say

• Define workholding devices and list commonly used workholding devices.

Do

• Define clamps and explain in detail the types of clamps.
• Define bench vise in detail.
• Define chucks and explain in detail the following types of chuck:
  » Four jaws or independent chuck
  » Three jaw chuck or self centering chuck
  » Combination chuck
  » Magnetic chuck
  » Collet chuck
7.6.1 Workholding devices

Work holding incorporates any gadget used to present and hold a workpiece to a cutting device.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 193-196 and explain the entire concept in detail to the learners.

Activity

- The trainer can conduct a Quiz to test the understanding of the learners as well as revise the main points of the course.
  - Divide the learners into 3 teams
  - Ask each team to formulate at least 10 questions from the complete module including
  - Conduct a QUIZ contest between the 3 teams, where one team asks questions on they made to the second team. The second team can earn a mutually agreed score if they get the answer correct. Then the second team asks questions on from the third team and then the third team will ask question from the first.
  - They can have 5-7 rounds
  - Any question that is not correctly answered will pass on to the next team
  - All questions and answers will be approved by the trainer
  - The trainer can also throw questions to the teams that are important but not covered by any of the teams
  - The trainer can ask one student to keep the score on the board
  - The winning team would get a standing ovation.

Exercise

1. What clamping devices can be used to hold workpieces for machining?
   a. Anvil
   b. Vice clamps
   c. Clamps
   d. Vice
2. The movable jaw of a bench vice is not moving even though the spindle is turned. It is due to
   a. the reason that
   b. fixed and movable jaws are overtight
   c. spindle pin is broken
   d. spring is not functioning
   e. threads on spindle are slightly worn out
3. The jaw plates of a bench vice are made of
   a. tool steel
   b. mild steel
   c. cast iron
   d. bronze
4. The bench vice spindle is made of
   a. Mild steel
   b. Cast iron
   c. Tool steel
   d. Bronze
8. Assembling Operations

Unit 8.1 - Assembling components
Unit 8.2 - Jointing of components
Unit 8.3 - Assembling procedure
At the end of this unit, you will be able to make the learners understand:

1. About requirements of components assembling
2. About nuts, bolts and screws jointing
3. About riveting
4. About jointing techniques i.e. welding, brazing, torqueing etc
5. About adhesive jointing
6. How to perform assembling process
UNIT 8.1: Assembling Components

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About threaded fasteners
2. About riveting
3. About circlips

Ask

Ask the learners to share:
• What do they know about assembling components

Say

• List the accessories and materials required for assembling components.
• Define threaded fasteners and explain in detail its following types:
  » Bolt
  » Stud
  » Cap Screw
  » Machine Screws
  » Nut
  » Washer

Demonstrate

• Bolts
• Types of Bolts

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Type</th>
<th>Description</th>
<th>Application Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hex head bolt</td>
<td>An externally threaded fastener with a triangular hex head, often with a washer face on the bearing side.</td>
<td>Used in a variety of general purpose applications in different grades depending on the required loads and material being joined.</td>
</tr>
<tr>
<td></td>
<td>Carriage bolt</td>
<td>A round head bolt with a square neck under the head and a standard thread.</td>
<td>Used in slots where the square neck keeps the bolt from turning when being tightened.</td>
</tr>
<tr>
<td></td>
<td>Elevator bolt or belt bolt</td>
<td>A bolt with a wide, countermark flat head, a shallow conical bearing surface, an integrally-formed square neck under the head and a standard thread.</td>
<td>Used in bolting and elevator applications where head clearances must be minimal.</td>
</tr>
<tr>
<td></td>
<td>Slotted tang bolt</td>
<td>A hex bolt with integrated washer, but wider than standard washers and incorporating serrations on the bearing surface side.</td>
<td>Used in applications where loosening hazard points, such as vibration applications. The serrations grip the surface so that more torque is needed to loosen than tighten the bolt.</td>
</tr>
<tr>
<td></td>
<td>Flat cap screw (slotted head shown)</td>
<td>A flat, countermark screw with a flat top surface and conical bearing surface.</td>
<td>A common fastener for assembling joints where head clearance is critical.</td>
</tr>
<tr>
<td></td>
<td>Buttonhead cap screw (socket head shown)</td>
<td>Dome shaped head that is wider and has a flatter profile than a flat cap screw.</td>
<td>Designed for light fastening applications where their appearance is desired. Not recommended for high-strength applications.</td>
</tr>
</tbody>
</table>

• Studs

• Types of Studs
• Types of Cap screws

<table>
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<td>Flat cap screw (slotted head shown)</td>
<td>A flat, countersunk screw with a flat top surface and conical bearing surface.</td>
<td>A common fastener for assembling joints where head clearance is critical.</td>
<td></td>
</tr>
<tr>
<td>Buttonhead cap screw (socket head shown)</td>
<td>Dome shaped head that is wider and has a lower profile than a flat cap screw.</td>
<td>Designed for light fastening applications where their appearance is desired. Not recommended for high-strength applications.</td>
<td></td>
</tr>
<tr>
<td>Lag screw</td>
<td>A screw with spaced threads, a hex head, and a gimlet point. (Can also be made with a square head.)</td>
<td>Used to fasten metal to wood or with expansion linings in masonry.</td>
<td></td>
</tr>
</tbody>
</table>

• Machine screws

• Nuts

<table>
<thead>
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<th>Application notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat washer</td>
<td>Flat washer</td>
<td>A washer with a flat profile and an integral nylon insert.</td>
<td>The nylon insert produces higher friction on the threads and prevents loosening due to vibration or corrosion.</td>
</tr>
<tr>
<td>Hex nut</td>
<td>A hex nut</td>
<td>A hex nut with a hex profile and an integral nylon insert.</td>
<td>Used to ensure exposed, dangerous bolt threads or for aesthetic reasons.</td>
</tr>
<tr>
<td>Cap nut</td>
<td>Similar to a hex nut with a dome top.</td>
<td>Used for general purpose tightening and locking. A set of hex or wrench can be inserted through the slot and a hole drilled through the fastener.</td>
<td></td>
</tr>
<tr>
<td>Castle nut</td>
<td>A type of castle nut.</td>
<td>Used for general purpose tightening and locking. A set of hex or wrench can be inserted through the slot and a hole drilled through the fastener.</td>
<td></td>
</tr>
<tr>
<td>Coupling nut</td>
<td>A coupling nut.</td>
<td>Used to join two externally threaded parts of equal thread diameter and pitch.</td>
<td></td>
</tr>
<tr>
<td>Hex jam nut</td>
<td>A hex nut</td>
<td>Used in conjunction with a hex nut to keep the nut from loosening.</td>
<td></td>
</tr>
<tr>
<td>Wing nut</td>
<td>An internally threaded nut with integral pronounced flanges.</td>
<td>Used for applications where repetitive hand tightening is required.</td>
<td></td>
</tr>
<tr>
<td>Serrated nut</td>
<td>A hex nut with integrated washers, but lower than standard washers and incorporating serrations on the bearing surface.</td>
<td>Used in applications where loosening hardware must, such as vibration applications. The serrations gripped the surface so that more torque is needed to loosen than to tighten the bolt.</td>
<td></td>
</tr>
</tbody>
</table>

• Types of nuts
Do
- Define circlips and explain its uses
- Define locking device
- Define locking nuts and washers
- Define lock wiring and tab washers

Demonstrate
- Circlips
- Locking nuts and washers
• Lock wiring

• Tab washers

---

**Explain**

• Define rivet
• Explain the following types of riveting:
  » Hot riveting
  » Cold riveting

---

**Demonstrate**

• Riveting
Discuss in detail the following types of valves:

- Ball valve
- Quarter-turn valve
- Control valves
- Valves & Liquid/Air pumps
- Spool valve
- Quick release Connectors and one-way Flow valves
- Pressure control valves
- Relief valves
- Pressure-reducing valves
- Sequence valves
- Counterbalance valves
- Over center valves
- Unloading valves
- Pinch valve
- Miniature Proportional valves
- Pneumatic valves
- Hygienic Diaphragm valves
**8.1.6 Valves**

**Types of Valves used in Life Sciences**

1. **Ball Valve**

   Every valve is exclusive according to its design, objective and purpose. It having linear action or rotary operation has a critical part of the durability and act of the valve in the services. To safeguard closing surfaces which can create a huge alteration exposed sealing mechanisms in contrast.

   **Ball Valve Advantages**
   - Continual exposure to the process flow to protect recessed seats

   Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 205-222 and explain the entire concept in detail to the learners.

**Exercise**

1. Which one of the following is a type of permanent fastener?
   a. Cotter joint
   b. Flange coupling
   c. Knuckle joint
   d. Riveted joint

2. Set screws are
   a. Similar to small size tap bolts except that a greater variety of shapes of heads are available
   b. Slotted for a screw driver and generally used with a nut
   c. Used to prevent relative motion between parts
   d. Similar to stud

3. A self locking screw has
   a. Fine threads
   b. Course threads
   c. Coefficient of friction is greater than tangent of load angle
   d. Hole for inserting split pin
4. Which of the following is the correct name for this screw?

- a. Cheese head screw
- b. Shoulder stud
- c. Hexagon set screw
- d. Hexagon bolt

5. Which of the following is the correct name for this screw?

- a. Stud bolt
- b. Shoulder stud
- c. Screw bolt
- d. Fitting bolt
UNIT 8.2: Jointing of Components

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About torque tightening
2. About welding
3. How to perform brazing and soldering
4. About adhesive jointing

Ask

Ask the learners to share:
• What do they know about torque tightening

Say

• Define torque and torque tightening
• Explain what is torque tightening and preload

Demonstrate

• Torque tightening
• Demonstrate the following steps of Torque procedure

When torquing it is common to tighten only one bolt at a time, this can result in Load Scatter and Point Loading. To avoid this, follow recommended model for apply torque in different stages:
» Step 1: Tightening by spanner make sure that 2-3 threads expand over nut.
» Step 2: Tight each bolt to 1/3rd of the final essential torque following the pattern.
Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 225-226 and explain the entire concept in detail to the learners.

Do

• Explain the learners about welding and its advantages over other methods
• Explain the following basic definitions used in welding:
  » Weld ability
  » Melting point
  » Thermal conductivity
  » Thermal expansion
• Define Arc Welders
• MIG Welding

Demonstrate

• Welding requirements

• Classification of welding
**Explain**

- Define Brazing
- Show and explain the following equipment of brazing:
  - Brazing torch
  - Filler Rod
  - Vaporizer
  - Personal Protective Equipment

**Demonstrate**

- Steps of brazing process
  - Step 1. Joint Design: Brazed joints ought to dependably have a slender gap into which the liquid filler metal can stream.
  - Step 2. Choice of Brazing Filler Metal Alloy: Combinations ought to be picked on their appropriateness for a specific application.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 229-230 and explain the entire concept in detail to the learners.

**Do**

- Discuss about Soldering.
- Discuss about Adhesive joints, its benefits and its types.

**Elaborate**

**8.2.3.2 Soldering**

Hard soldering, or silver soldering, is similar to the brazing process except that the rod is an alloy of silver and copper. Silver soldering rods are expensive.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 230-231 and explain the entire concept in detail to the learners.
Notes for Facilitation

- Encourage participants to ask questions so that they can clear their doubts (if any)
- Help participants to complete all the tasks included in the participant manual.
- Allow participants to share and draw from their prior knowledge and experience, and link them to the learning taking place.

Exercise

1. Which one of the following is a temporary joint?
   a. Welded joint
   b. Riveted joint
   c. Soldered joint
   d. Press fit joint

2. One of the functions of electrode coating is
   a. to increase welding current
   b. to stabilize the arc
   c. to prevent rusting
   d. to control arc temperature

3. The correct flame for preheating before cutting is
   a. oxidizing flame
   b. neutral flame
   c. carburising flame
   d. None of these

4. The correct colours for oxygen and acetylene hoses are:
   a. Red for oxygen and blue for acetylene
   b. Black for oxygen and red for acetylene
   c. Black for oxygen and maroon for acetylene
   d. Red for oxygen and maroon for acetylene
UNIT 8.3: Assembling procedure

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About assembling procedure

Ask

Ask the learners to share:
• What do they know about assembling procedure

Say

• Discuss about components assembly activities

Demonstrate

• Effectively prepare machines and tools
  » Step 1. Ensure and check all tools and gear required amid get together is prepared for operation.
  » Step 2. Check calibration of all measuring instruments.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 232 and explain the entire concept in detail to the learners.

• Do leveling and assembling of equipments or components
  » Step 1. Lift and move mechanical parts utilizing dealing with equipment, for example, lift or crane or manual techniques
  » Step 2. Use file or chisel to level or align the components according to the manufacturer’s standards.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 232 and explain the entire concept in detail to the learners.
Activity

- Randomly pair students and ask them to pick any two topics of their choice from units 8.1, 8.2, and 8.3 and ask them to explain them.
- Make sure no topic is left unexplained.
- Clear the doubts of the learners if any and provide feedback accordingly keeping their presentation and clarity of topics in mind.
9. Maintenance and Repair

Unit 9.1- Resource Degradation and Related Decision-Making
Unit 9.2- Maintenance in Life Sciences Sector
Key Learning Outcomes

At the end of this unit, you will be able to make the learners understand:

1. About resource degradation
2. Types of resource degradation
3. How to perform corrective maintenance of machines
4. How to perform preventive maintenance of machines
UNIT 9.1: Resource Degradation and Related Decision-Making

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About resource degradation
2. Types of resource degradation

Ask

Ask the learners to share:
• What do they know about resource degradation

Say

• Define resource degradation and types of degradation
• Discuss about corrective or preventive action
• Explain time scales
• Explain degradation dynamics

Do

• Discuss upstream and downstream processes.
• Discuss about possibility of detection.
• Explain uncertainty and observability.
• Explain outlook.

Elaborate

9.1.1 Resource degradation

Although resource is a general term, it is used in this work to specifically refer to a machine, equipment or tool group that facilitates lab work. In general, all laboratories equipment is prone to degradation with time. The features listed below determine their impact on decisions related to manufacturing.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 235-241 and explain the entire concept in detail to the learner.
Activity

- Select learners randomly and ask them to extempore on resource degradation.

Exercise

1. What is resource degradation?
   ...........................................................................................................................

2. What are the types of degradation?
   ...........................................................................................................................

3. What is corrective or preventive action?
   ...........................................................................................................................
UNIT 9.2: Maintenance in Life Sciences Sector

Unit Objectives

At the end of the unit, you will be able to make the learners understand:
1. About resource degradation
2. Types of resource degradation

Ask

Ask the students to share their views on:
- What do they know about preventive maintenance in Pharma plant

Say

- Explain preventive maintenance in Pharma plant and its following aspects:
  - Equipment failure
  - Mechanical parts
- Discuss with the learners how to choose an effective preventive maintenance strategy and explain the following factors in detail that are known to have an effect on the cost of maintenance:
  - Category of machine
  - Labour source
  - Machine parts
  - Maintenance delivery methodology
  - Frequency of maintenance
  - Maintenance scheduling
  - Required compliance documentation and reporting guidelines

Elaborate

9.2.1 Preventive Maintenance in Pharma Plant

The Preventive Maintenances in Pharma Plant can be divided into two aspects:
1. Equipment Failure: These incidents happen very frequently due to the wear of the machine parts. It is very crucial that this maintenance is done regularly to keep the equipment as well as the machine in perfect condition within the said specification.
Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 242-245 and explain the entire concept in detail to the learners.

**Do**

- Discuss with the learners the steps required for preventive maintenance of equipment/machines in Life Sciences plant/lab.
- Discuss with the learners the steps required for corrective/breakdown maintenance of equipment/machines in Life Sciences Plant/Lab.
- Explain the learners the change control procedure.

**Elaborate**

**9.2.3 Steps for Preventive Maintenance (PM) of equipment/machines in Life Sciences plant/lab**

1. Preparing and maintaining a PM Checklist carefully made based on previous records, inspections, maintenance manuals and OEM recommendations.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 242-245 and explain the entire concept in detail to the learners.

**Exercise**

1. What is preventive maintenance in Pharma Plant?

2. Explain any three of the following:
   a. Category of machine
   b. Labour source
   c. Frequency of maintenance
   d. Maintenance delivery methodology
10. Quality check and Testing

Unit 10.1- Quality Checks and Inspection tests
Unit 10.2 Corrective actions taken and review of their Effectiveness
Key Learning Outcomes

At the end of the unit, you will be able to make the learners understand:
1. About importance of quality checks
2. About different inspection tests
3. About corrective measures taken after quality checks
Unit 10.1: Quality Checks and Inspection tests

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

• About importance of quality checks
• About different types of inspection test

Ask

Ask the learners to share:

• Their views on quality checks and its importance

Say

• Discuss with the learners the importance of quality checks.

Do

• Explain the following inspection tests:
  » Visual inspection
  » Non-destructive
  » Destructive testing

Explain

• Explain destructive tests in detail:
  » Tensile test
  » Bend test
  » Impact test
  » Hardness test
Demonstrate

- Destructive tests
  - Tensile Test
  - Bend Test
  - Impact Test
  - Hardness Test
Explain

• Explain destructive tests in detail:
  » radiographic test Bend test
  » Ultrasonic test (UT) Hardness test

Activity

• Select the learners randomly and ask them to extempore on the following inspection tests:
  » Visual inspection
  » Non-Destructive
  » Destructive testing

Elaborate

10.1.1 Importance of quality checks

Quality can be described as fulfillment of customer requisites and specifications defect free.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 251-256 and explain the entire concept in detail to the learners.

Exercise

1. Quality checks don’t include inspection of raw material.
   a. True
   b. False

2. Which is not a input for the production
   a. Machine
   b. Tools
   c. Man
   d. None

3. Destructive tests examines the
   a. Mechanical properties
   b. Chemical properties
   c. Metallurgical properties
   d. All of these
4. Earthing can be checked by using
   a. Height gauge
   b. Neon tester
   c. Megger
   d. None
Unit 10.2 Corrective actions taken and review of their Effectiveness

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

• How to take corrective actions
• How to review and report the corrective actions effectiveness to the management

Ask

Ask the learners to share:

• Their views on corrective measures taken after inspection

Say

• Discuss with the learners the corrective measures that takes place after inspection

Do

• Explain effectiveness review analysis of corrective actions

Elaborate

10.2.1 Corrective measures taken after inspection

After performing certain inspection and testing methods, if any defect or fault identify in the machine, equipments and tools, corrective actions has to be taken for resolving the issues.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 258-259 and explain the entire concept in detail to the learners.
11. Risk Management and Reporting

Unit 11.1 - Risk Management
Unit 11.2 - Escalation Matrix
Unit 11.3 - Accident Reporting
Unit 11.4 - Defects Reporting
Key Learning Outcomes

At the end of this unit, you will be able to make the learners understand:

1. About identification of problem
2. About risk management process
3. About escalation matrix and problem escalation process
4. About reporting and documentation requirements
5. About accident reporting
6. About reporting of defective tools
Unit 11.1: Risk Management

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

• About risk management process
• About inspecting controlling and controlling the problems

Ask

Ask the learners to share:

• Their views on risk management process

Say

• Explain the learners about risk management process.
• Tell the learners how to control problems by explaining the following:
  » Elimination
  » Substitution
  » Engineering
  » Administrative
  » PPE

Do

• Discuss workplace inspections.

Demonstrate

• Risk Management process
Activity

- Ask students to write an article (150-200 words) on Risk Management.
- Provide them instructions that the article should cover risk management process.
- Grade the learners as per their performance and if required explain, in detail the complete risk management process.

Elaborate

11.1.3 Workplace Inspections

One key factor of risk management is Workplace Safety Inspections. Inspections are key means to make sure that the workplace remains safe. They assist us in recognizing and dealing with the new problems or dangerous situations.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 263-264 and explain the entire concept in detail to the learners.

Exercise

1. What is risk management process?

2. Explain how to control problems?

3. What is workplace inspection?
Unit 11.2: Escalation Matrix

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

- About problem management process
- About Escalation matrix

Ask

Ask the learners to share:

- What do they know about Escalation Matrix

Say

- Tell the learners about Escalation process.
- Tell the learners how does Escalation matrix works.

Demonstrate
Activity

- Divide the class into two groups ask each group to explain what is escalation matrix one by one in their own words.

Exercise

1. What is escalation matrix?

2. Explain how does escalation matrix works.
Unit 11.3: Accident Reporting

Unit Objectives
At the end of the unit, you will be able to make the learners understand:

- About accident and incident reporting
- How to write reports properly

Ask
Ask the learners to share:
- What do they know about Accident and Incidents reporting

Say
- Discuss Reporting format.
- Tell the learners how to file reports and documents properly.

Elaborate
11.3.1 Accidents and incidents reporting
It is of utmost importance to inform about the accidents and incidence straightaway, irrespective of the impact of it.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 268-271 and explain the entire concept in detail to the learners.

Exercise
1. Assume you got an accident at work place on your knees. File a report and inform the management about the accident.

...........................................................................................................................................................................................................................................................................
2. What is important in an accident investigation?
   a. Only to interview the victim.
   b. To clear up the site of the accident as quickly as possible in order to prevent new accidents.
   c. To collect all facts and information at the location of the accident.
   d. None of these
Unit 11.4: Defects Reporting

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

- About reporting of faulty and damage tools

Ask

Ask the learners to share:

- What do they know about Accident and Incidents reporting

Say

- Discuss with the learners about Reporting of faulty and damage tools

Elaborate

11.4.1 Reporting of faulty and damage tools

Like accident or incident reporting, reporting of faulty and damaged machines, tools and equipments is also necessary.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 272 and explain the entire concept in detail to the learners.

Activity

- Divide class into two groups.
- Ask each group to create multiple choice questions from units 11.1, 11.2, 11.3 and 11.4.
- The groups will ask questions to each other.
- Evaluate and explain the concept as per performance.
12. Work Effectively with Others

Unit 12.1 - Ensure appropriate communication with others
Unit 12.2 - Workplace Etiquettes
At the end of this unit, you will be able to make the learners understand:

1. About communication with colleagues
2. About Workplace Etiquettes
3. How to work in a team
Unit 12.1: Risk management

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

- How to communicate effectively with colleagues
- About effective communication

Ask

Ask the learners to share:

- Their views on effective communication

Say

- Discuss with the learners about “communicate with others properly”.
- Explain the following points to achieve better communication with colleagues at workplace:
  - Listen actively
  - Face to face talk and speak with pleasure
  - Offer constructive criticism
  - Build and earn trust
  - Get personal but don’t be too casual
  - Tell them how what you’re communicating is relevant to them
  - Keep spoken and written communication short, simple and direct

Elaborate

12.1.1 Communicate with others properly

What will be the reaction of yours when people say a largely about you. The success of the organization depends on each colleague.

- For success of organization learn your co-workers’ names and learn them quickly because people loves hear their names.

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 275-277 and explain the entire concept in detail to the learners.
Role Play

- Divide the class in pairs and ask the learners to perform a role play.
- One partner will play the role of senior employee while the other will play the role of executive employee.
- Tell them the senior employee can start the conversation with executive employee by asking him/her about their experience of working with others in the company.
- Call the pairs one by one in front of the class to enact the role play.
- Follow the same pattern for all the pairs.
- Time allotted for each pair is 3-5 minutes.
- Ask the class to applaud after each performance.
- Evaluate and provide feedback after each performance on the basis of their communication skills.

Exercise

1. Explain any two of the following:
   a. Listen actively
   b. Build and earn trust
   c. Get personal but don’t get too casual
   d. Offer constructive criticism
Unit 12.2: Workplace Etiquettes

Unit Objectives

At the end of the unit, you will be able to make the learners understand:

• Organization policies and procedures
• Workplace Etiquettes

Ask

Ask the learners to share:

• What do they know about Workplace Etiquettes
• Their views on Workplace Etiquettes

Say

• Tell the learners about Organization policies and procedures and ask them to follow them.
• Discuss with the learners about Workplace Etiquettes and explain in detail the following tips to succeed on the workplace:
  » Making a good impression
  » Workspace savvy

Elaborate

12.2.1 Follow organization policies and procedures

Organization policies and procedures while working with colleagues:

• Never use abusive words with the colleagues
• Follow work etiquettes

Trainers note: These are supporting content to the participant manual, please adhere to the participant manual, page no. 278-280 and explain the entire concept in detail to the learners.
Exercise

1. What are workplace etiquettes?
13. Employability and Entrepreneurship Skills

Unit 13.1 – Personal Strengths & Value Systems
Unit 13.2 – Digital Literacy: A Recap
Unit 13.3 – Money Matters
Unit 13.4 – Preparing for Employment & Self Employment
Unit 13.5 – Understanding Entrepreneurship
Unit 13.6 – Preparing to be an Entrepreneur
Key Learning Outcomes

At the end of this module, you will be able to:

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Understand the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
10. Understand motivation with the help of Maslow’s Hierarchy of Needs
11. Discuss the meaning of achievement motivation
12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
14. Discuss how to maintain a positive attitude
15. Discuss the role of attitude in self-analysis
16. List your strengths and weaknesses
17. Discuss the qualities of honest people
18. Describe the importance of honesty in entrepreneurs
19. Discuss the elements of a strong work ethic
20. Discuss how to foster a good work ethic
21. List the characteristics of highly creative people
22. List the characteristics of highly innovative people
23. Discuss the benefits of time management
24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management
32. Identify the basic parts of a computer
33. Identify the basic parts of a keyboard
34. Recall basic computer terminology
35. Recall basic computer terminology
36. Recall the functions of basic computer keys
37. Discuss the main applications of MS Office
38. Discuss the benefits of Microsoft Outlook
39. Discuss the different types of e-commerce
40. List the benefits of e-commerce for retailers and customers
41. Discuss how the Digital India campaign will help boost e-commerce in India
42. Explain how you will sell a product or service on an e-commerce platform
43. Discuss the importance of saving money
44. Discuss the benefits of saving money
45. Discuss the main types of bank accounts
46. Describe the process of opening a bank account
47. Differentiate between fixed and variable costs
48. Describe the main types of investment options
49. Describe the different types of insurance products
50. Describe the different types of taxes
51. Discuss the uses of online banking
52. Discuss the main types of electronic funds transfers
53. Discuss the steps to prepare for an interview
54. Discuss the steps to create an effective Resume
55. Discuss the most frequently asked interview questions
56. Discuss how to answer the most frequently asked interview questions
57. Discuss basic workplace terminology
58. Discuss the concept of entrepreneurship
59. Discuss the importance of entrepreneurship
60. Describe the characteristics of an entrepreneur
61. Describe the different types of enterprises
62. List the qualities of an effective leader
63. Discuss the benefits of effective leadership
64. List the traits of an effective team
65. Discuss the importance of listening effectively
66. Discuss how to listen effectively
67. Discuss the importance of speaking effectively
1. Discuss how to speak effectively
2. Discuss how to solve problems
3. List important problem solving traits
4. Discuss ways to assess problem solving skills
5. Discuss the importance of negotiation
6. Discuss how to negotiate
7. Discuss how to identify new business opportunities
8. Discuss how to identify business opportunities within your business
9. Understand the meaning of entrepreneur
10. Describe the different types of entrepreneurs
11. List the characteristics of entrepreneurs
12. Recall entrepreneur success stories
13. Discuss the entrepreneurial process
14. Describe the entrepreneurship ecosystem
15. Discuss the government’s role in the entrepreneurship ecosystem
16. Discuss the current entrepreneurship ecosystem in India
17. Understand the purpose of the Make in India campaign
18. Discuss the relationship between entrepreneurship and risk appetite
19. Discuss the relationship between entrepreneurship and resilience
20. Describe the characteristics of a resilient entrepreneur
21. Discuss how to deal with failure
22. Discuss how market research is carried out
23. Describe the 4 Ps of marketing
24. Discuss the importance of idea generation
25. Recall basic business terminology
26. Discuss the need for CRM
27. Discuss the benefits of CRM
28. Discuss the need for networking
29. Discuss the benefits of networking
30. Understand the importance of setting goals
31. Differentiate between short-term, medium-term and long-term goals
32. Discuss how to write a business plan
33. Explain the financial planning process
34. Discuss ways to manage your risk
35. Describe the procedure and formalities for applying for bank finance
UNIT 13.1: Personal Strengths & Value Systems

Unit Objectives

At the end of the unit, students will be able to:

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Understand the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
10. Understand motivation with the help of Maslow’s Hierarchy of Needs
11. Discuss the meaning of achievement motivation
12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
14. Discuss how to maintain a positive attitude
15. Discuss the role of attitude in self-analysis
16. List your strengths and weaknesses
17. Discuss the qualities of honest people
18. Describe the importance of honesty in entrepreneurs
19. Discuss the elements of a strong work ethic
20. Discuss how to foster a good work ethic
21. List the characteristics of highly creative people
22. List the characteristics of highly innovative people
23. Discuss the benefits of time management
24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management
Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- Pc with LCD Projector or Flip Chart.
- Participant Manual.
- Copies of Handouts.

Do

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Acknowledge their responses and clear their doubts if any.
- Tell them they will learn about Personal Strengths and value systems.

Say

- Tell the participants about the Health, Habits and Hygiene. What is Health? As per the World Health Organization (WHO), health is a “State of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.”

Elaborate

Explain – This means being healthy does not simply mean not being unhealthy – it also means you need to be at peace emotionally, and feel fit physically. For example, you cannot say you are healthy simply because you do not have any physical ailments like a cold or cough. You also need to think about whether you are feeling calm, relaxed and happy.

**Common Health Issues**

Some common health issues are:

- Allergies
- Asthma
- Skin Disorders
- Depression and Anxiety
- Diabetes
- Cough, Cold, Sore Throat
- Difficulty Sleeping
- Obesity
Say

• Give participants some tips to prevent health issues.

Elaborate

Explain – Taking measures to prevent ill health is always better than curing a disease or sickness. You can stay healthy by:

• Eating healthy foods like fruits, vegetables and nuts
• Cutting back on unhealthy and sugary foods
• Drinking enough water everyday
• Not smoking or drinking alcohol
• Exercising for at least 30 minutes a day, 4-5 times a week
• Taking vaccinations when required
• Practicing yoga exercises and meditation

How many of these health standards do you follow? Tick the ones that apply to you.

• Get minimum 7-8 hours of sleep every night.
• Avoid checking email first thing in the morning and right before you go to bed at night.
• Don’t skip meals – eat regular meals at correct meal times.
• Read a little bit every single day.
• Eat more home cooked food than junk food
• Stand more than you sit.
• Drink a glass of water first thing in the morning and have at least 8 glasses of water through the day.
• Go to the doctor and dentist for regular checkups.
• Exercise for 30 minutes at least 5 days a week.
• Avoid consuming lots of aerated beverages.

Say

• Tell the participants what is hygiene. As per the World Health Organization (WHO), “Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases.” In other words, hygiene means ensuring that you do whatever is required to keep your surroundings clean, so that you reduce the chances of spreading germs and diseases.
Elaborate

Explain – For instance, think about the kitchen in your home. Good hygiene means ensuring that the kitchen is always spick and span, the food is put away, dishes are washed and dustbins are not overflowing with garbage. Doing all this will reduce the chances of attracting pests like rats or cockroaches, and prevent the growth of fungus and other bacteria, which could spread disease.

How many of these health standards do you follow? Tick the ones that apply to you.

- Have a bath or shower every day with soap – and wash your hair with shampoo 2-3 times a week.
- Wear a fresh pair of clean undergarments every day.
- Brush your teeth in the morning and before going to bed.
- Cut your fingernails and toenails regularly.
- Wash your hands with soap after going to the toilet.
- Use an anti-perspirant deodorant on your underarms if you sweat a lot.
- Wash your hands with soap before cooking or eating.
- Stay home when you are sick, so other people don’t catch what you have.
- Wash dirty clothes with laundry soap before wearing them again.
- Cover your nose with a tissue/your hand when coughing or sneezing.

See how healthy and hygienic you are, by giving yourself 1 point for every ticked statement! Then take a look at what your score means.

Your Score

- 0-7/20: You need to work a lot harder to stay fit and fine! Make it a point to practice good habits daily and see how much better you feel!
- 7-14/20: Not bad, but there is scope for improvement! Try and add a few more good habits to your daily routine.
- 14-20/20: Great job! Keep up the good work! Your body and mind thank you.

Say

- Tell the participants about the Swatch Bharat Abhiyan. The ‘Swachh Bharat Abhiyan’ (Clean India Mission) launched by Prime Minister Shri Narendra Modi on 2nd October 2014, believes in doing exactly this. The aim of this mission is to clean the streets and roads of India and raise the overall level of cleanliness. Currently this mission covers 4,041 cities and towns across the country. Millions of our people have taken the pledge for a clean India. You should take the pledge too, and do everything possible to keep our country clean!
- Also tell the participants about the habits.
Elaborate

Explain – A habit is a behaviour that is repeated frequently. All of us have good habits and bad habits. Keep in mind the phrase by John Dryden: “We first make our habits, and then our habits make us.” This is why it is so important that you make good habits a way of life, and consciously avoid practicing bad habits.

Some good habits that you should make part of your daily routine are:

- Always having a positive attitude
- Making exercise a part of your daily routine
- Reading motivational and inspirational stories
- Smiling! Make it a habit to smile as often as possible
- Making time for family and friends
- Going to bed early and waking up early

Some bad habits that you should quit immediately are:

- Skipping breakfast
- Snacking frequently even when you are not hungry
- Eating too much fattening and sugary food
- Smoking, drinking alcohol and doing drugs
- Spending more money than you can afford
- Worrying about unimportant issues
- Staying up late and waking up late

Do

Give participants some safety tips to design a safe workplace. Every employer is obligated to ensure that his workplace follows the highest possible safety protocol. When setting up a business, owners must make it a point to:

- Use ergonomically designed furniture and equipment to avoid stooping and twisting
- Provide mechanical aids to avoid lifting or carrying heavy objects
- Have protective equipment on hand for hazardous jobs
- Designate emergency exits and ensure they are easily accessible
- Set down health codes and ensure they are implemented
- Follow the practice of regular safety inspections in and around the workplace
- Ensure regular building inspections are conducted
- Get expert advice on workplace safety and follow it
• Tell the participants about the Negotiable Employee Safety Habits.

**Elaborate**

Tell them – Every employer is obligated to ensure that his workplace follows the highest possible safety protocol. When setting up a business, owners must make it a point to:

• Immediately report unsafe conditions to a supervisor
• Recognize and report safety hazards that could lead to slips, trips and falls
• Report all injuries and accidents to a supervisor
• Wear the correct protective equipment when required
• Learn how to correctly use equipment provided for safety purposes
• Be aware of and avoid actions that could endanger other people
• Take rest breaks during the day and some time off from work during the week

**Say**

• Tell the participants about the Self Analysis. To truly achieve your full potential, you need to take a deep look inside yourself and find out what kind of person you really are. This attempt to understand your personality is known as self-analysis. Assessing yourself in this manner will help you grow, and will also help you to identify areas within yourself that need to be further developed, changed or eliminated.

• Tell the participants about the motivation. Very simply put, motivation is your reason for acting or behaving in a certain manner. It is important to understand that not everyone is motivated by the same desires – people are motivated by many, many different things. We can understand this better by looking at Maslow’s Hierarchy of Needs.

• Also tell the participants about the Maslow’s Hierarchy of needs.

**Elaborate**

Tell them – Famous American psychologist Abraham Maslow wanted to understand what motivates people. He believed that people have five types of needs, ranging from very basic needs (called physiological needs) to more important needs that are required for self-growth (called self-actualization needs). Between the physiological and self-actualization needs are three other needs – safety needs, belongingness and love needs, and esteem needs. These needs are usually shown as a pyramid with five levels and are known as Maslow’s Hierarchy of Needs.
As you can see from the pyramid, the lowest level depicts the most basic needs. Maslow believed that our behaviour is motivated by our basic needs, until those needs are met. Once they are fulfilled, we move to the next level and are motivated by the next level of needs. Let’s understand this better with an example:

“Rupa comes from a very poor family. She never has enough food, water, warmth or rest. According to Maslow, until Rupa is sure that she will get these basic needs, she will not even think about the next level of needs – her safety needs. But, once Rupa is confident that her basic needs will be met, she will move to the next level, and her behaviour will then be motivated by her need for security and safety. Once these new needs are met, Rupa will once again move to the next level, and be motivated by her need for relationships and friends. Once this need is satisfied, Rupa will then focus on the fourth level of needs – her esteem needs, after which she will move up to the fifth and last level of needs – the desire to achieve her full potential.”

Say

• Tell the participants about the Achievements Motivation. We now know that people are motivated by basic, psychological and self-fulfillment needs. However, certain people are also motivated by the achievement of highly challenging accomplishments. This is known as Achievement Motivation, or ‘need for achievement’.

Elaborate

Tell them – The level of motivation achievement in a person differs from individual to individual. It is important that entrepreneurs have a high level of achievement motivation – a deep desire to accomplish something important and unique. It is equally important that they hire people who are also highly motivated by challenges and success.

Characteristics of Entrepreneurs with Achievement Motivation

• Entrepreneurs with achievement motivation can be described as follows:
  • Unafraid to take risks for personal accomplishment
  • Love being challenged Future-oriented Flexible and adaptive
  • Value negative feedback more than positive feedback
  • Very persistent when it comes to achieving goals
  • Extremely courageous
  • Highly creative and innovative
  • Restless - constantly looking to achieve more
  • Feel personally responsible for solving problems

Think about it:

• How many of these traits do you have?
• Can you think of entrepreneurs who display these traits?
Tell the participants how to cultivate a positive attitude. The good news is attitude is a choice. So it is possible to improve, control and change our attitude, if we decide we want to!

Tell them – The following tips help foster a positive mindset:

- Remember that you control your attitude, not the other way around
- Devote at least 15 minutes a day towards reading, watching or listening to something positive
- Avoid negative people who only complain and stop complaining yourself
- Expand your vocabulary with positive words and delete negative phrases from your mind
- Be appreciative and focus on what’s good in yourself, in your life, and in others
- Stop thinking of yourself as a victim and start being proactive
- Imagine yourself succeeding and achieving your goals

Tell the participants about the attitude. Now that we understand why motivation is so important for self-analysis, let’s look at the role our attitude plays in better understanding ourselves. Attitude can be described as your tendency (positive or negative), to think and feel about someone or something

Tell them – Attitude is the foundation for success in every aspect of life. Our attitude can be our best friend or our worst enemy. In other words:

“The only disability in life is a bad attitude.”

When you start a business, you are sure to encounter a wide variety of emotions, from difficult times and failures to good times and successes. Your attitude is what will see you through the tough times and guide you towards success. Attitude is also infectious. It affects everyone around you, from your customers to your employees to your investors. A positive attitude helps build confidence in the workplace while a negative attitude is likely to result in the demotivation of your people.
• Tell the participants about the Honesty and Work Ethics. Honesty is the quality of being fair and truthful. It means speaking and acting in a manner that inspires trust.

Tell them – A person who is described as honest is seen as truthful and sincere, and as someone who isn’t deceitful or devious and doesn’t steal or cheat. There are two dimensions of honesty – one is honesty in communication and the other is honesty in conduct. Honesty is an extremely important trait because it results in peace of mind and builds relationships that are based on trust. Being dishonest, on the other hand, results in anxiety and leads to relationships full of distrust and conflict.

• Tell the participants about the Qualities of Honesty People.

Tell them – Honest individuals have certain distinct characteristics. Some common qualities among honest people are:

• They don’t worry about what others think of them. They believe in being themselves – they don’t bother about whether they are liked or disliked for their personalities.

• They stand up for their beliefs. They won’t think twice about giving their honest opinion, even if they are aware that their point of view lies with the minority.

• They are think skinned. This means they are not affected by others judging them harshly for their honest opinions.

• They forge trusting, meaningful and healthy friendships. Honest people usually surround themselves with honest friends. They have faith that their friends will be truthful and upfront with them at all times.

They are trusted by their peers. They are seen as people who can be counted on for truthful and objective feedback and advice.

• Honesty and employees: When entrepreneurs build honest relationships with their employees, it leads to more transparency in the workplace, which results in higher work performance and better results.

• Honesty and investors: For entrepreneurs, being honest with investors means not only sharing strengths but also candidly disclosing current and potential weaknesses, problem areas and solution strategies. Keep
in mind that investors have a lot of experience with startups and are aware that all new companies have problems. Claiming that everything is perfectly fine and running smoothly is a red flag for most investors.

- **Honesty with oneself:** The consequences of being dishonest with oneself can lead to dire results, especially in the case of entrepreneurs. For entrepreneurs to succeed, it is critical that they remain realistic about their situation at all times, and accurately judge every aspect of their enterprise for what it truly is.

**What are Work Ethics?**

Being ethical in the workplace means displaying values like honesty, integrity and respect in all your decisions and communications. It means not displaying negative qualities like lying, cheating and stealing. Workplace ethics play a big role in the profitability of a company. It is as crucial to an enterprise as high morale and teamwork. This is why most companies lay down specific workplace ethic guidelines that must compulsorily be followed by their employees. These guidelines are typically outlined in a company’s employee handbook.

**Say**

- Tell the participants about the Elements of Work Ethics.

**Elaborate**

Tell them – An entrepreneur must display strong work ethics, as well as hire only those individuals who believe in and display the same level of ethical behavior in the workplace. Some elements of a strong work ethic are:

- **Professionalism:** This involves everything from how you present yourself in a corporate setting to the manner in which you treat others in the workplace.

- **Respectfulness:** This means remaining poised and diplomatic regardless of how stressful or volatile a situation is.

- **Dependability:** This means always keeping your word, whether it’s arriving on time for a meeting or delivering work on time.

- **Dedication:** This means refusing to quit until the designated work is done, and completing the work at the highest possible level of excellence.

- **Determination:** This means embracing obstacles as challenges rather than letting them stop you, and pushing ahead with purpose and resilience to get the desired results.

- **Accountability:** This means taking responsibility for your actions and the consequences of your actions, and not making excuses for your mistakes.

- **Humility:** This means acknowledging everyone’s efforts and hard work, and sharing the credit for accomplishments.
• Tell the participants how to foster a good work ethic. As an entrepreneur, it is important that you clearly define the kind of behavior that you expect from each and every team member in the workplace.

Elaborate

Tell them – You should make it clear that you expect employees to display positive work ethics like:

• **Honesty**: All work assigned to a person should be done with complete honesty, without any deceit or lies.
• **Good attitude**: All team members should be optimistic, energetic, and positive.
• **Reliability**: Employees should show up where they are supposed to be, when they are supposed to be there.
• **Good work habits**: Employees should always be well groomed, never use inappropriate language, conduct themselves professionally at all times, etc.
• **Initiative**: Doing the bare minimum is not enough. Every team member needs to be proactive and show initiative.
• **Trustworthiness**: Trust is non-negotiable. If an employee cannot be trusted, it’s time to let that employee go.
• **Respect**: Employees need to respect the company, the law, their work, their colleagues and themselves.
• **Integrity**: Each and every team member should be completely ethical and must display above board behaviour at all times.
• **Efficiency**: Efficient employees help a company grow while inefficient employees result in a waste of time and resources.

Say

• Tell the participants about the creativity and innovation.

Elaborate

**What is Creativity?**

Creativity means thinking outside the box. It means viewing things in new ways or from different perspectives, and then converting these ideas into reality. Creativity involves two parts: thinking and producing. Simply having an idea makes you imaginative, not creative. However, having an idea and acting on it makes you creative.
Characteristics of Highly Creative People
Some characteristics of creative people are:

- They are imaginative and playful
- They see issues from different angles
- They notice small details
- They have very little tolerance for boredom
- They detest rules and routine
- They love to daydream
- They are very curious

What is Innovation?
There are many different definitions of innovation. In simple terms, innovation means turning an idea into a solution that adds value. It can also mean adding value by implementing a new product, service or process, or significantly improving on an existing product, service or process.

Characteristics of Highly Innovative People
Some characteristics of highly innovative people are:

- They embrace doing things differently
- They don’t believe in taking shortcuts
- They are not afraid to be unconventional
- They are highly proactive and persistent
- They are organized, cautious and risk-averse

Say

- Tell the participants about the Time Management. Time management is the process organizing your time, and deciding how to allocate your time between different activities. Good time management is the difference between working smart (getting more done in less time) and working hard (working for more time to get more done).

Elaborate

Tell them – Effective time management leads to an efficient work output, even when you are faced with tight deadlines and high pressure situations. On the other hand, not managing your time effectively results in inefficient output and increases stress and anxiety.

Benefits of Time Management
Time management can lead to huge benefits like:

- Greater productivity
• Higher efficiency
• Better professional reputation
• Reduced stress
• Higher chances for career advancement
• Greater opportunities to achieve goals

Not managing time effectively can result in undesirable consequences like:
• Missing deadlines
• Inefficient work output
• Substandard work quality
• Poor professional reputation
• Stalled career
• Increase in stress and anxiety

Do ✅

Discuss with the participants about the Traits of effective Time Managers. Some traits of effective time managers are:
• They begin projects early They set daily objectives
• They modify plans if required, to achieve better results
• They are flexible and open-minded
• They inform people in advance if their help will be required
• They know how to say no
• They break tasks into steps with specific deadlines
• They continually review long term goals
• They think of alternate solutions if and when required
• They ask for help when required They create backup plans

Say 🎤

• Tell the participants about the effective time management techniques.
**Elaborate**

Tell them – You can manage your time better by putting into practice certain time management techniques. Some helpful tips are:

- Plan out your day as well as plan for interruptions. Give yourself at least 30 minutes to figure out your time plan. In your plan, schedule some time for interruptions.
- Put up a “Do Not Disturb” sign when you absolutely have to complete a certain amount of work.
- Close your mind to all distractions. Train yourself to ignore ringing phones, don’t reply to chat messages and disconnect from social media sites.
- Delegate your work. This will not only help your work get done faster, but will also show you the unique skills and abilities of those around you.
- Stop procrastinating. Remind yourself that procrastination typically arises due to the fear of failure or the belief that you cannot do things as perfectly as you wish to do them.
- Prioritize. List each task to be completed in order of its urgency or importance level. Then focus on completing each task, one by one.
- Maintain a log of your work activities. Analyze the log to help you understand how efficient you are, and how much time is wasted every day.
- Create time management goals to reduce time wastage.

**Say**

- Now tell the participants about the Anger Management.

**Elaborate**

Tell them – Anger management is the process of:

- Learning to recognize the signs that you, or someone else, is becoming angry
- Taking the best course of action to calm down the situation in a positive way Anger management does not mean suppressing anger.

**Importance of Anger Management**

Anger is a perfectly normal human emotion. In fact, when managed the right way, anger can be considered a healthy emotion. However, if it is not kept in check, anger can make us act inappropriately and can lead to us saying or doing things that we will likely later regret.

**Extreme anger can:**

- **Hurt you physically:** It leads to heart disease, diabetes, a weakened immune system, insomnia, and high blood pressure.
- **Hurt you mentally:** It can cloud your thinking and lead to stress, depression and mental health issues.
• Hurt your career: It can result in alienating your colleagues, bosses, clients and lead to the loss of respect.
• Hurt your relationships: It makes it hard for your family and friends to trust you, be honest with you and feel comfortable around you.

This is why anger management, or managing anger appropriately, is so important.

Say

• Tell the participants about the Anger Management Strategies.

Elaborate

Tell them – Here are some strategies that can help you control your anger:
Strategy 1: Relaxation
Strategy 2: Cognitive Restructuring
Strategy 3: Problem Solving
Strategy 4: Better Communication
Strategy 5: Changing Your Environment

Trainer’s Note: These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 261 and explain trainees' the concept.

Say

• Tell the participants about the Stress Management. We say we are ‘stressed’ when we feel overloaded and unsure of our ability to deal with the pressures placed on us. Anything that challenges or threatens our well-being can be defined as a stress.

Elaborate

Tell them – It is important to note that stress can be good and bad. While good stress keeps us going, negative stress undermines our mental and physical health. This is why it is so important to manage negative stress effectively.

Causes of Stress
Stress can be caused by internal and external factors.
Internal causes of stress:
• Constant worry
• Rigid thinking
• Unrealistic expectations
• Pessimism
• Negative self-talk
• All in or all out attitude

External causes of stress:
• Major life changes
• Difficulties with relationships
• Having too much to do
• Difficulties at work or in school
• Financial difficulties
• Worrying about one’s children and/or family

Say

• Tell the participants about the Symptoms of Stress.

Elaborate

Tell them – Stress can manifest itself in numerous ways. Take a look at the cognitive, emotional, physical and behavioral symptoms of stress.

<table>
<thead>
<tr>
<th>Cognitive Symptoms</th>
<th>Emotional Symptoms</th>
<th>Physical Symptoms</th>
<th>Behavioral Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory problems</td>
<td>Depression</td>
<td>Aches and pain</td>
<td>Increase or decrease in appetite</td>
</tr>
<tr>
<td>Concentration issues</td>
<td>Agitation</td>
<td>Diarrhea or constipation</td>
<td>Over sleeping or not sleeping enough</td>
</tr>
<tr>
<td>Lack of judgement</td>
<td>Irritability</td>
<td>Nausea</td>
<td>Withdrawing socially</td>
</tr>
<tr>
<td>Pessimism</td>
<td>Loneliness</td>
<td>Dizziness</td>
<td>Ignoring responsibilities</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Anxiety</td>
<td>Chest pain and/or rapid heartbeat</td>
<td>Consumption of alcohol or cigarettes</td>
</tr>
<tr>
<td>Constant worrying</td>
<td>Anger</td>
<td>Frequent cold or flu like feelings</td>
<td>Nervous habits like nail biting, pacing etc.</td>
</tr>
</tbody>
</table>
Give participants Tips for managing Stress. The following tips can help you manage your stress better:

- Note down the different ways in which you can handle the various sources of your stress.
- Remember that you cannot control everything, but you can control how you respond.
- Discuss your feelings, opinions and beliefs rather than reacting angrily, defensively or passively.
- Practice relaxation techniques like meditation, yoga or tai chi when you start feeling stressed.
- Devote a part of your day towards exercise.
- Eat healthy foods like fruits and vegetables. Avoid unhealthy foods especially those containing large amounts of sugar.
- Plan your day so that you can manage your time better, with less stress.
- Say no to people and things when required.
- Schedule time to pursue your hobbies and interests.
- Ensure you get at least 7-8 hours of sleep.
- Reduce your caffeine intake.
- Increase the time spent with family and friends.

Notes for Facilitation

- Summarise the main points of the unit.
- Ask participants if they have any doubts. Encourage them to ask questions.
- Answer their queries satisfactorily.
- Ask them to answer the questions at the end of unit given in the participant’s manual.
- Ensure that every participant answer all questions.

Activity

- Divide the class into two equal groups.
- Tell the participants they have to give a presentation on Work Ethics and Innovation.
- Tell them they would be given a time of 20 minute for preparation. The time for presentation for each group should not exceed 20 minutes per group.
- Once the presentations are complete appreciate the efforts made by the group and summarize the highlights of the activity.

<table>
<thead>
<tr>
<th>Skill Practice</th>
<th>Time</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Presentation on work ethics and innovation</td>
<td>2 Hours</td>
<td>• Charts and markers</td>
</tr>
</tbody>
</table>
UNIT 13.2: Digital Literacy: A Recap

Unit Objectives

At the end of the unit, students will be able to:

1. Identify the basic parts of a computer
2. Identify the basic parts of a keyboard
3. Recall basic computer terminology
4. Recall basic computer terminology
5. Recall the functions of basic computer keys
6. Discuss the main applications of MS Office
7. Discuss the benefits of Microsoft Outlook
8. Discuss the different types of e-commerce
9. List the benefits of e-commerce for retailers and customers
10. Discuss how the Digital India campaign will help boost e-commerce in India
11. Describe how you will sell a product or service on an e-commerce platform

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- PC with LCD Projector or Flip Chart.
- Participant Manual.
- Copies of Handouts.

Do

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Acknowledge their responses and clear their doubts if any.
- Tell them they will learn about Digital Literacy.

Say

- Tell the participants about the basic parts of a Computer.
Elaborate

- **Central Processing Unit (CPU):** The brain of the computer. It interprets and carries out program instructions.
- **Hard Drive:** A device that stores large amounts of data.
- **Monitor:** The device that contains the computer screen where the information is visually displayed.
- **Desktop:** The first screen displayed after the operating system loads.
- **Background:** The image that fills the background of the desktop.
- **Mouse:** A hand-held device used to point to items on the monitor.
- **Speakers:** Devices that enable you to hear sound from the computer.
- **Printer:** A device that converts output from a computer into printed paper documents.
- **Icon:** A small picture or image that visually represents something on your computer.
- **Cursor:** An arrow which indicates where you are positioned on the screen.
- **Program Menu:** A list of programs on your computer that can be accessed from the Start menu.
- **Taskbar:** The horizontal bar at the bottom of the computer screen that lists applications that are currently in use.
- **Recycle Bin:** A temporary storage for deleted files.

Do

Discuss with the participants about the basic internet terms.

- **The Internet:** Avast, international collection of computer networks that transfers information.
- **The World Wide Web:** A system that lets you access information on the Internet.
- **Website:** A location on the World Wide Web (and Internet) that contains information about a specific topic.
- **Homepage:** Provides information about a website and directs you to other pages on that website.
- **Link/Hyperlink:** A highlighted or underlined icon, graphic, or text that takes you to another file or object.
- **Web Address/URL:** The address for a website.
- **Address Box:** A box in the browser window where you can type in a web address.

Say

- Tell the participants about the basic computer keys.
  - **Arrow Keys:** Press these keys to move your cursor.
  - **Space bar:** Adds a space.
  - **Enter/Return:** Moves your cursor to a new line.
  - **Shift:** Press this key if you want to type a capital letter or the upper symbol of a key.
Caps Lock: Press this key if you want all the letters you type to be capital letters. Press it again to revert back to typing lowercase letters.

Backspace: Deletes everything to the left of your cursor.

Also tell the participants about the MS office and Email.

Elaborate

Tell them – MS Office or Microsoft Office is a suite of computer programs developed by Microsoft. Although meant for all users, it offers different versions that cater specifically to students, home users and business users. All the programs are compatible with both, Windows and Macintosh.

**Most Popular Office Products**

Some of the most popular and universally used MS Office applications are:

1. **Microsoft Word**: Allows users to type text and add images to a document.
2. **Microsoft Excel**: Allows users to enter data into a spreadsheet and create calculations and graphs.
3. **Microsoft PowerPoint**: Allows users to add text, pictures and media and create slideshows and presentations.
4. **Microsoft Outlook**: Allows users to send and receive email.
5. **Microsoft OneNote**: Allows users to make drawings and notes with the feel of a pen on paper.
6. **Microsoft Access**: Allows users to store data over many tables.

**Why Choose Microsoft Outlook**

A popular email management choice especially in the workplace, Microsoft Outlook also includes an address book, notebook, web browser and calendar. Some major benefits of this program are:

- Integrated search function: You can use keywords to search for data across all Outlook programs.
- Enhanced security: Your email is safe from hackers, junk mail and phishing website email.
- Email syncing: Sync your mail with your calendar, contact list, notes in One Note and...your phone!
- Offline access to email: No Internet? No problem! Write emails offline and send them when you’re connected again.

Say

- Tell the participants about the E-Commerce. E-commerce is the buying or selling of goods and services, or the transmitting of money or data, electronically on the internet. E-Commerce is the short form for “electronic commerce.”
Tell them – Followings are the examples of E-Commerce:

- Online shopping
- Online auctions
- Online ticketing
- Electronic payments
- Internet banking

Types of E-Commerce

E-commerce can be classified based on the types of participants in the transaction. The main types of e-commerce are:

- **Business to Business (B2B)**: Both the transacting parties are businesses.
- **Business to Consumer (B2C)**: Businesses sell electronically to end-consumers.
- **Consumer to Consumer (C2C)**: Consumers come together to buy, sell or trade items to other consumers.
- **Consumer-to-Business (C2B)**: Consumers make products or services available for purchase to companies looking for exactly those services or products.
- **Business-to-Administration (B2A)**: Online transactions conducted between companies and public administration.
- **Consumer-to-Administration (C2A)**: Online transactions conducted between individuals and public

The e-commerce business provides some benefits for retailers and customers.

**Benefits for retailers:**

- Establishes an online presence
- Reduces operational costs by removing overhead costs
- Increases brand awareness through the use of good keywords
- Increases sales by removing geographical and time constraints

**Benefits for customers:**

- Offers a wider range of choice than any physical store
- Enables goods and services to be purchased from remote locations
- Enables consumers to perform price comparisons

Do

- Discuss with the participants about the Digital India Campaign. Prime Minister Narendra Modi launched the Digital India campaign in 2015, with the objective of offering every citizen of India access to digital services, knowledge and information. The campaign aims to improve the country’s online infrastructure and increase internet connectivity, thus boosting the e-commerce industry.
- Currently, the majority of online transactions come from tier 2 and tier 3 cities. Once the Digital India campaign is in place, the government will deliver services through mobile connectivity, which will help deliver internet to remote corners of the country. This will help the e-commerce market to enter India’s tier 4 towns and rural areas.
E-Commerce Activity

Choose a product or service that you want to sell online. Write a brief note explaining how you will use existing e-commerce platforms, or create a new e-commerce platform, to sell your product or service.

Notes for Facilitation

- Summarise the main points of the unit.
- Ask participants if they have any doubts. Encourage them to ask questions.
- Answer their queries satisfactorily.
- Ask them to answer the questions at the end of unit given in the participant’s manual.
- Ensure that every participant answer all questions.

Activity

- Divide the class into two equal groups.
- Tell the participants they have to demonstration the steps of opening a Bank account and on online banking.
- Tell them they would be given a time of 20 minute for preparation. The time for presentation for each group should not exceed 20 minutes per group.
- Once the presentations are complete appreciate the efforts made by the group and summarize the highlights of the activity.

<table>
<thead>
<tr>
<th>Skill Practice</th>
<th>Time</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate the process of opening a bank account and how to use online banking</td>
<td>2 Hours</td>
<td>• Charts and markers</td>
</tr>
</tbody>
</table>
UNIT 13.3: Money Matters

Unit Objectives

At the end of the unit, students will be able to:

1. Discuss the importance of saving money
2. Discuss the benefits of saving money
3. Discuss the main types of bank accounts
4. Describe the process of opening a bank account
5. Differentiate between fixed and variable costs
6. Describe the main types of investment options
7. Describe the different types of insurance products
8. Describe the different types of taxes
9. Discuss the uses of online banking
10. Discuss the main types of electronic funds transfers

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- PC with LCD Projector or Flip Chart.
- Participant Manual.
- Copies of Handouts.

Do

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Acknowledge their responses and clear their doubts if any.
- Tell them they will learn about Money Matters.

Say

- Tell the participants about the Personal Finance. We all know that the future is unpredictable. You never know what will happen tomorrow, next week or next year. That’s why saving money steadily through the years is so important.
Elaborate

Tell them – Saving money will help improve your financial situation over time. But more importantly, knowing that you have money stashed away for an emergency will give you peace of mind. Saving money also opens the door to many more options and possibilities.

Benefits of Saving

Inculcating the habit of saving leads to a vast number of benefits. Saving helps you:

- **Become financially independent:** When you have enough money saved up to feel secure you can start making your choices, from taking a vacation whenever you want, to switching careers or starting your own business.
- **Invest in yourself through education:** Through saving, you can earn enough to pay up for courses that will add to your professional experience and ultimately result in higher paying jobs.
- **Get out of debt:** Once you have saved enough as a reserve fund, you can use your savings to pay off debts like loans or bills that have accumulated over time.
- **Be prepared for surprise expenses:** Having money saved enables you to pay for unforeseen expenses like sudden car or house repairs, without feeling financially stressed.
- **Pay for emergencies:** Saving helps you deal with emergencies like sudden health issues or emergency trips without feeling financially burdened.
- **Afford large purchases and achieve major goals:** Saving diligently makes it possible to place down payments towards major purchases and goals, like buying a home or a car.
- **Retire:** The money you have saved over the years will keep you comfortable when you no longer have the income you would get from your job.

Say

- Tell the participants about the Types of Bank Accounts.

Elaborate

Tell them – In India, banks offer four main types of bank accounts. These are:

- Current Accounts
- Savings Accounts
- Recurring Deposit Accounts
- Fixed Deposit Accounts

**Trainer’s Note:** These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 270 and explain trainees’ the concept.
Tell the participants about Opening a Bank Accounts.

Elaborate

Tell them – Opening a bank account is quite a simple process. Take a look at the steps to open an account of your own:

**Step 1: Fill in the Account Opening Form**

This form requires you to provide the following information:

- Personal details (name, address, phone number, date of birth, gender, occupation, address)
- Method of receiving your account statement (hard copy/email)
- Details of your initial deposit (cash/cheque)
- Manner of operating your account (online/mobile banking/traditional via cheque, slip books) Ensure that you sign wherever required on the form.

**Step 2: Affix your Photograph**

Stick a recent photograph of yourself in the allotted space on the form.

**Step 3: Provide your Know Your Customer (KYC) Details**

KYC is a process that helps banks verify the identity and address of their customers. To open an account, every individual needs to submit certain approved documents with respect to photo identity (ID) and address proof. Some Officially Valid Documents (OVDs) are:

- Passport
- Driving License
- Voters’ Identity Card
- PAN Card
- UIDAI (Aadhaar) Card

**Step 4: Submit All your Documents**

Submit the completed Account Opening Form and KYC documents. Then wait until the forms are processed and your account has been opened!

Say

Tell the participants about Fixed and variable costs.
**Elaborate**

Tell them – Fixed costs and variable costs together make up a company’s total cost. These are the two types of costs that companies have to bear when producing goods and services. A fixed cost does not change with the volume of goods or services a company produces. It always remains the same. A variable cost, on the other hand, increases and decreases depending on the volume of goods and services produced. In other words, it varies with the amount produced.

**Differences between Fixed and Variable Costs**

Let’s take a look at some of the main differences between fixed and variable costs:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Fixed Costs</th>
<th>Variable Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meaning</strong></td>
<td>A cost that stays the same, regardless of the output produced.</td>
<td>A cost that changes when the volume produced.</td>
</tr>
<tr>
<td><strong>Nature</strong></td>
<td>Time related.</td>
<td>Volume related.</td>
</tr>
<tr>
<td><strong>Incurred</strong></td>
<td>Incurred irrespective of units being produced.</td>
<td>Incurred only when units are produced.</td>
</tr>
<tr>
<td><strong>Unit cost</strong></td>
<td>Inversely proportional to the number of units produced.</td>
<td>Remains the same, per unit.</td>
</tr>
<tr>
<td><strong>Examples</strong></td>
<td>Depreciation, rent, salary, insurance, tax etc.</td>
<td>Material consumed, wages, commission on sales, packing expenses, etc.</td>
</tr>
</tbody>
</table>

**Elaborate**

Tell them – Investment means that money is spent today with the aim of reaping financial gains at a future time. The main types of investment options are as follows:

- Bonds
- Stocks
- Small Savings
- Mutual Funds
- Fixed Deposits
- Real Estate
- Hedge Funds
- Private Equity
- Venture Capital
Insurance
There are two types of insurance:
1. Life Insurance
2. Non-Life or General Insurance.

Trainer’s Note: These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 272 and explain trainees' the concept.

Say

- Tell the participants about the online banking, NEFT, RTGS etc.

Elaborate

Tell them – Internet or online banking allows account holders to access their account from a laptop at any location. In this way, instructions can be issued. To access an account, account holders simply need to use their unique customer ID number and password.

Internet banking can be used to:
- Find out an account balance
- Transfer amounts from one account to another
- Arrange for the issuance of cheques
- Instruct payments to be made
- Request for a cheque book
- Request for a statement of accounts
- Make a fixed deposit

Trainer’s Note: These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 275 and explain trainees' the concept.

Notes for Facilitation

- Summarise the main points of the unit.
- Ask participants if they have any doubts. Encourage them to ask questions.
- Answer their queries satisfactorily.
- Ask them to answer the questions at the end of unit given in the participant’s manual.
- Ensure that every participant answer all questions.
UNIT 13.4: Preparing for Employment & Self Employment

Unit Objectives

At the end of the unit, students will be able to:
1. Discuss the steps to prepare for an interview
2. Discuss the steps to create an effective Resume
3. Discuss the most frequently asked interview questions
4. Discuss how to answer the most frequently asked interview questions
5. Discuss basic workplace terminology

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- Pc with LCD Projector or Flip Chart.
- Participant Manual.
- Copies of Handouts.

Do

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Acknowledge their responses and clear their doubts if any.
- Tell them they will learn about Employment and Self Employment.

Say

- Tell the participants about the Interview Preparation. The success of your getting the job that you want depends largely on how well your interview for that job goes. Therefore, before you go in for your interview, it is important that you prepare for it with a fair amount of research and planning.
Tell them – Take a look at the steps to follow in order to be well prepared for an interview:

- Research the organization that you are having the interview with.
- Think about whether your skills and qualifications match the job requirements.
- Go through the most typical interview questions asked, and prepare your responses.
- Plan your attire for the interview.
- Ensure that you have packed everything that you may require during the interview.
- Remember the importance of non-verbal communication.
- Make a list of questions to end the interview with.

**Trainer’s Note:** These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 278 and explain trainees' the concept.

Tell the participants how to prepare an effective resume. A resume is a formal document that lists a candidate’s work experience, education and skills. A good resume gives a potential employer enough information to believe the applicant is worth interviewing. That’s why it is so important to create a résumé that is effective.

Tell them – Take a look at the steps to create an effective resume:

**Step 1:** Write the Address Section

**Step 2:** Add the Profile Summary Section

**Step 3:** Include Your Educational Qualifications

**Step 4:** List Your Technical Skills

**Step 5:** Insert Your Academic Project Experience

**Step 6:** List Your Strengths

**Step 7:** List Your Extracurricular Activities

**Step 8:** Write Your Personal Details

**Trainer’s Note:** These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 280 and explain trainees' the concept.

Tell the participants about the interview FAQs.
Elaborate

Tell them – Take a look at some of the most frequently asked interview questions, and some helpful tips on how to answer them.

**Can you tell me a little about yourself?**

Tips to answer:
- Don’t provide your full employment or personal history.
- Offer 2-3 specific experiences that you feel are most valuable and relevant.
- Conclude with how those experiences have made you perfect for this specific role.

**How did you hear about the position?**

Tips to answer:
- Tell the interviewer how you heard about the job – whether it was through a friend (name the friend), event or article (name them) or a job portal (say which one).
- Explain what excites you about the position and what in particular caught your eye about this role.

**What do you know about the company?**

Tips to answer:
- Don’t recite the company’s About Us page.
- Show that you understand and care about the company’s goals.
- Explain why you believe in the company’s mission and values.

*Trainer’s Note:* These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 282 and explain trainees' the concept.

Say

- Tell the participants about the work readiness.

Elaborate

Tell them – Every employee should be well versed in the following terms:
- **Annual leave**: Paid vacation leave given by employers to employees.
- **Background Check**: A method used by employers to verify the accuracy of the information provided by potential candidates.
- **Benefits**: A part of an employee’s compensation package.
- **Breaks**: Short periods of rest taken by employees during working hours.
- **Compensation Package**: The combination of salary and benefits that an employer provides to his/her employees.
- **Compensatory Time (Comp Time):** Time off in lieu of pay.
- **Contract Employee:** An employee who works for one organization that sells said employee’s services to another company, either on a project or time basis.

**Trainer’s Note:** These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 284 and explain trainees' the concept.

**Notes for Facilitation**

- Summarise the main points of the unit.
- Ask participants if they have any doubts. Encourage them to ask questions.
- Answer their queries satisfactorily.
- Ask them to answer the questions at the end of unit given in the participant’s manual.
- Ensure that every participant answer all questions.
UNIT 13.5: Understand Entrepreneurship

Unit Objectives

At the end of the unit, students will be able to:

1. Discuss the concept of entrepreneurship
2. Discuss the importance of entrepreneurship
3. Describe the characteristics of an entrepreneur
4. Describe the different types of enterprises
5. List the qualities of an effective leader
6. Discuss the benefits of effective leadership
7. List the traits of an effective team
8. Discuss the importance of listening effectively
9. Discuss how to listen effectively
10. Discuss the importance of speaking effectively
11. Discuss how to speak effectively
12. Discuss how to solve problems
13. List important problem solving traits
14. Discuss ways to assess problem solving skills
15. Discuss the importance of negotiation
16. Discuss how to negotiate
17. Discuss how to identify new business opportunities
18. Discuss how to identify business opportunities within your business
19. Understand the meaning of entrepreneur
20. Describe the different types of entrepreneurs
21. List the characteristics of entrepreneurs
22. Recall entrepreneur success stories
23. Discuss the entrepreneurial process
24. Describe the entrepreneurship ecosystem
25. Discuss the government’s role in the entrepreneurship ecosystem
26. Discuss the current entrepreneurship ecosystem in India
27. Understand the purpose of the Make in India campaign
28. Discuss the relationship between entrepreneurship and risk appetite
29. Discuss the relationship between entrepreneurship and resilience
30. Describe the characteristics of a resilient entrepreneur
31. Discuss how to deal with failure
**Resources to be Used**

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- PC with LCD Projector or Flip Chart.
- Participant Manual.
- Copies of Handouts.

**Do**

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Acknowledge their responses and clear their doubts if any.
- Tell them they will learn about Entrepreneurship.

**Say**

- Tell the participants about the Entrepreneurship. Anyone who is determined to start a business, no matter what the risk, is an entrepreneur. Entrepreneurs run their own start-up, take responsibility for the financial risks and use creativity, innovation and vast reserves of self-motivation to achieve success.
- Tell the participants about the importance and characteristics of Entrepreneurship.

**Elaborate**

Tell them – Entrepreneurship is very important for the following reasons:
- It results in the creation of new organizations
- It brings creativity into the marketplace
- It leads to improved standards of living
- It helps develop the economy of a country

**Characteristics of Entrepreneurs**

All successful entrepreneurs have certain characteristics in common.

They are all:
- Extremely passionate about their work
- Confident in themselves
- Disciplined and dedicated
• Motivated and driven
• Highly creative
• Visionaries
• Open-minded
• Decisive

Entrepreneurs also have a tendency to:
• Have a high risk tolerance
• Thoroughly plan everything
• Manage their money wisely
• Make their customers their priority
• Understand their offering and their market in detail
• Ask for advice from experts when required
• Know when to cut their losses

Say

• Tell the participants about the types of enterprises.

Elaborate

Tell them – As an entrepreneur in India, you can own and run any of the following types of enterprises:

Sole Proprietorship
In a sole proprietorship, a single individual owns, manages and controls the enterprise. This type of business is the easiest to form with respect to legal formalities. The business and the owner have no separate legal existence. All profit belongs to the proprietor, as do all the losses- the liability of the entrepreneur is unlimited.

Partnership
A partnership firm is formed by two or more people. The owners of the enterprise are called partners. A partnership deed must be signed by all the partners. The firm and its partners have no separate legal existence. The profits are shared by the partners. With respect to losses, the liability of the partners is unlimited. A firm has a limited life span and must be dissolved when any one of the partners dies, retires, claims bankruptcy or goes insane.

Limited Liability Partnership (LLP)
In a Limited Liability Partnership or LLP, the partners of the firm enjoy perpetual existence as well as the advantage of limited liability. Each partner’s liability is limited to their agreed contribution to the LLP. The partnership and its partners have a separate legal existence.
Tell the participants about the Leadership and team Work. Leadership means setting an example for others to follow. Setting a good example means asking someone to do something that you wouldn’t willingly want to do yourself. Leadership is about figuring out what to do in order to win as a team, and as a company. Leaders believe in doing the right things.

Also tell the participants about the Leadership qualities that all entrepreneurs need.

Tell the participants about the benefits of effective Leadership. Effective leadership results in numerous benefits. Great leadership leads to the leader successfully:

- Gaining the loyalty and commitment of the team members
- Motivating the team to work towards achieving the company’s goals and objectives
- Building morale and instilling confidence in the team members
- Fostering mutual understanding and team-spirit among team members
- Convincing team members about the need to change when a situation requires adaptability

Discuss with the participants about the teamwork and teams. Teamwork occurs when the people in a workplace combine their individual skills to pursue a common goal. Effective teams are made up of individuals who work together to achieve this common goal. A great team is one who holds themselves accountable for the end result.

Also tell the participants about the importance of team work in entrepreneurial success.

Tell them – Building a successful enterprise is only possible if the entrepreneur in charge possesses excellent leadership qualities. Some critical leadership skills that every entrepreneur must have are:

- **Pragmatism:** This means having the ability to highlight all obstacles and challenges, in order to resolve issues and reduce risks.
- **Humility:** This means admitting to mistakes often and early, and being quick to take responsibility for your actions. Mistakes should be viewed as challenges to overcome, not opportunities to point blame.
- **Flexibility:** It is critical for a good leader to be very flexible and quickly adapt to change. It is equally critical to know when to adapt and when not to.
- **Authenticity:** This means showing both, your strengths and your weaknesses. It means being human and showing others that you are human.
- **Reinvention:** This means refreshing or changing your leadership style when necessary. To do this, it’s important to learn where your leadership gaps lie and find out what resources are required to close them.
- **Awareness:** This means taking the time to recognize how others view you. It means understanding how your presence affects those around you.
Tell them – For an entrepreneurial leader, building an effective team is critical to the success of a venture. An entrepreneur must ensure that the team he builds possesses certain crucial qualities, traits and characteristics. An effective team is one which has:

- **Unity of purpose**: All the team members should clearly understand and be equally committed to the purpose, vision and goals of the team.
- **Great communication skills**: Team members should have the ability to express their concerns, ask questions and use diagrams, and charts to convey complex information.
- **The ability to collaborate**: Every member should feel entitled to provide regular feedback on new ideas.
- **Initiative**: The team should consist of proactive individuals. The members should have the enthusiasm to come up with new ideas, improve existing ideas, and conduct their own research.
- **Visionary members**: The team should have the ability to anticipate problems and act on these potential problem before they turn into real problems.
- **Great adaptability skills**: The team must believe that change is a positive force. Change should be seen as the chance to improve and try new things.
- **Excellent organizational skills**: The team should have the ability to develop standard work processes, balance responsibilities, properly plan projects, and set in place methods to measure progress and ROI.

Tell them – To listen effectively you should:

- Stop talking
- Stop interrupting
- Focus completely on what is being said
- Nod and use encouraging words and gestures
- Be open-minded
- Think about the speaker’s perspective
- Be very, very patient
• Pay attention to the tone that is being used
• Pay attention to the speaker’s gestures, facial expressions and eye movements
• Not try and rush the person
• Not let the speaker’s mannerisms or habits irritate or distract you

How to Listen Effectively

How successfully a message gets conveyed depends entirely on how effectively you are able to get it through. An effective speaker is one who enunciates properly, pronounces words correctly, chooses the right words and speaks at a pace that is easily understandable. Besides this, the words spoken out loud need to match the gestures, tone and body language used.

What you say, and the tone in which you say it, results in numerous perceptions being formed. A person who speaks hesitantly may be perceived as having low self-esteem or lacking in knowledge of the discussed topic. Those with a quiet voice may very well be labelled as shy. And those who speak in commanding tones with high levels of clarity, are usually considered to be extremely confident. This makes speaking a very critical communication skill.

Say

• Tell the participants how to speak effectively.

Elaborate

Tell them – To speak effectively you should:
• Incorporate body language in your speech like eye contact, smiling, nodding, gesturing etc.
• Build a draft of your speech before actually making your speech.
• Ensure that all your emotions and feelings are under control.
• Pronounce your words distinctly with the correct pitch and intensity. Your speech should be crystal clear at all times.
• Use a pleasant and natural tone when speaking. Your audience should not feel like you are putting on an accent or being unnatural in any way.
• Use precise and specific words to drive your message home. Ambiguity should be avoided at all costs.
• Ensure that your speech has a logical flow.
• Be brief. Don’t add any unnecessary information.
• Make a conscious effort to avoid irritating mannerisms like fidgeting, twitching etc.
• Choose your words carefully and use simple words that the majority of the audience will have no difficulty understanding.
• Use visual aids like slides or a whiteboard.
Tell the participants about the problem solving and negotiation skills. As per The Concise Oxford Dictionary (1995), a problem is, “A doubtful or difficult matter requiring a solution”. All problems contain two elements:

- **Goals**
- **Obstacles**

The aim of problem solving is to recognize the obstacles and remove them in order to achieve the goals

- Also tell the participants how to solve the problems.

---

Tell them – Solving a problem requires a level of rational thinking. Here are some logical steps to follow when faced with an issue:

1. **Step 1**: Identify the problem
2. **Step 2**: Study the problem in detail
3. **Step 3**: List all possible solutions
4. **Step 4**: Select the best solution
5. **Step 5**: Implement the chosen solution
6. **Step 6**: Check that the problem has really been solved

---

Discuss with the participants about the important traits for problem solving. Highly developed problem solving skills are critical for both, business owners and their employees. The following personality traits play a big role in how effectively problems are solved:

- Being open minded
- Asking the right questions
- Being proactive
- Not panicking
• Having a positive attitude
• Focusing on the right problem

Tell the participants about the negotiation. Negotiation is a method used to settle differences. The aim of negotiation is to resolve differences through a compromise or agreement while avoiding disputes. Without negotiation, conflicts are likely to lead to resentment between people.

Tell them – Good negotiation skills help satisfy both parties and go a long way towards developing strong relationships.

**Why Negotiate**

Starting a business requires many, many negotiations. Some negotiations are small while others are critical enough to make or break a startup. Negotiation also plays a big role inside the workplace. As an entrepreneur, you need to know not only how to negotiate yourself, but also how to train employees in the art of negotiation.

**How to Negotiate**

Take a look at some steps to help you negotiate:

• **Step 1:** Pre-Negotiation Preparation: Agree on where to meet to discuss the problem, decide who all will be present and set a time limit for the discussion.

• **Step 2:** Discuss the Problem: This involves asking questions, listening to the other side, putting your views forward and clarifying doubts.

• **Step 3:** Clarify the Objective: Ensure that both parties want to solve the same problem and reach the same goal.

• **Step 4:** Aim for a Win-Win Outcome: Try your best to be open minded when negotiating. Compromise and offer alternate solutions to reach an outcome where both parties win.

• **Step 5:** Clearly Define the Agreement: When an agreement has been reached, the details of the agreement should be crystal clear to both sides, with no scope for misunderstandings.

• **Step 6:** Implement the Agreed Upon Solution: Agree on a course of action to set the solution in motion.

Now tell the participants about the Business opportunities Identification.
Elaborate

Tell them – The ability to identify business opportunities is an essential characteristic of an entrepreneur.

What is an Opportunity?
The word opportunity suggests a good chance or a favourable situation to do something offered by circumstances.

A business opportunity means a good or favourable change available to run a specific business in a given environment, at a given point of time.

Common Questions Faced by Entrepreneurs
A critical question that all entrepreneurs face is how to go about finding the business opportunity that is right for them.

Some common questions that entrepreneurs constantly think about are:

• Should the new enterprise introduce a new product or service based on an unmet need?
• Should the new enterprise select an existing product or service from one market and offer it in another where it may not be available?
• Should the enterprise be based on a tried and tested formula that has worked elsewhere?

It is therefore extremely important that entrepreneurs must learn how to identify new and existing business opportunities and evaluate their chances of success.

Trainer’s Note: These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 295 and explain trainees’ the concept.

Say

• Now tell the participants about the Entrepreneurship Support eco-system.

Elaborate

Tell them – An entrepreneur is a person who

• Does not work for an employee
• Runs a small enterprise
• Assumes all the risks and rewards of the enterprise, idea, good or service

Types of Entrepreneurs
There are four main types of entrepreneurs:

• The Traditional Entrepreneur
• The Growth Potential Entrepreneur
• The Project-Oriented Entrepreneur
Discuss with the participants about the Entrepreneur Success Stories.

Dhiru Bhai Ambani

Dhirubhai Ambani began his entrepreneurial career by selling “bhajias” to pilgrims in Mount Girnar on weekends. At 16, he moved to Yemen where he worked as a gas-station attendant, and as a clerk in an oil company. He returned to India with Rs. 50,000 and started a textile trading company. Reliance went on to become the first Indian company to raise money in global markets and the first Indian company to feature in Forbes 500 list.

Dr. Karsanbhai Patel

Karsanbhai Patel made detergent powder in the backyard of his house. He sold his product door-to-door and offered a money back guarantee with every pack that was sold. He charged Rs. 3 per kg when the cheapest detergent at that time was Rs.13 per kg. Dr. Patel eventually started Nirma which became a whole new segment in the Indian domestic detergent market.

• Now tell the participants about the Entrepreneurial Process.
Tell them – Let’s take a look at the stages of the entrepreneurial process.

- **Stage 1:** Idea Generation. The entrepreneurial process begins with an idea that has been thought of by the entrepreneur. The idea is a problem that has the potential to be solved.
- **Stage 2:** Germination or Recognition. In this stage a possible solution to the identified problem is thought of.
- **Stage 3:** Preparation or Rationalization. The problem is studied further and research is done to find out how others have tried to solve the same problem.
- **Stage 4:** Incubation or Fantasizing. This stage involves creative thinking for the purpose of coming up with more ideas. Less thought is given to the problem areas.
- **Stage 5:** Feasibility Study: The next step is the creation of a feasibility study to determine if the idea will make a profit and if it should be seen through.
- **Stage 6:** Illumination or Realization. This is when all uncertain areas suddenly become clear. The entrepreneur feels confident that his idea has merit.
- **Stage 7:** Verification or Validation. In this final stage, the idea is verified to see if it works and if it is useful.

Take a look at the diagram below to get a better idea of this process.

---

**Say**

- Now tell the participants about the Entrepreneur. The entrepreneurship support ecosystem signifies the collective and complete nature of entrepreneurship. New companies emerge and flourish not only because of the courageous, visionary entrepreneurs who launch them, but they thrive as they are set in an environment or ‘ecosystem’ made of private and public participants.

---

**Elaborate**

Tell them – These players nurture and sustain the new ventures, facilitating the entrepreneurs’ efforts.

**An entrepreneurship ecosystem comprises of the following six domains:**

- **Favourable Culture:** This includes elements such as tolerance of risk and errors, valuable networking and positive social standing of the entrepreneur.
- **Facilitating Policies & Leadership:** This includes regulatory framework incentives and existence of public research institutes.
- **Financing Options:** Angel financing, venture capitalists and micro loans would be good examples of this.
- **Human Capital:** This refers to trained and untrained labour, entrepreneurs and entrepreneurship training programmes, etc.
- **Conducive Markets for Products & Services:** This refers to an existence or scope of existence of a market for the product/service.
• **Institutional & Infrastructural Support:** This includes legal and financing advisers, telecommunications, digital and transportation infrastructure, and entrepreneurship networking programmes.

These domains indicate whether there is a strong entrepreneurship support ecosystem and what actions should the government put in place to further encourage this ecosystem. The six domains and their various elements have been graphically depicted.

Every entrepreneurship support ecosystem is unique and all the elements of the ecosystem are interdependent. Although every region’s entrepreneurship ecosystem can be broadly described by the above features, each ecosystem is the result of the hundred elements interacting in highly complex and particular ways.

Entrepreneurship ecosystems eventually become (largely) self-sustaining. When the six domains are resilient enough, they are mutually beneficial. At this point, government involvement can and should be significantly minimized. Public leaders do not need to invest a lot to sustain the ecosystem. It is imperative that the entrepreneurship ecosystem incentives are formulated to be self-liquidating, hence focusing on sustainability of the environment.

---

**Say**

• Now tell the participants about the Government’s role in the Entrepreneurship Ecosystem. Encouraging new ventures is a major focus for policymakers. Governments across the world are recognizing that new businesses flourish in distinctive types of supportive environments.

---

**Elaborate**

Tell them – Policymakers should study the scenario and take into account the following points whilst they formulate policies and regulations that enable successful entrepreneurship support ecosystems.

• Policymakers should avoid regulations that discourage new entrants and work towards building efficient methods for business startups. Policies and regulations that favour existing, dominant firms over entrepreneurial ventures restrict competition and obstruct entry for new companies.

• Instead of developing policies conceptually intended to correct market failures, policymakers should interact with entrepreneurs and understand the challenges faced by them. The feedback should be used to develop policies that incite idea exploration, product development and increased rates of deal flow.

• Entrepreneurial supporters should create a database that enables identifying who the participants in the ecosystem are and how they are connected. These ecosystem maps are useful tools in developing engagement strategies.

• Disruptions are unavoidable in economic and social life. However, it’s important to note that economic disruption gives rise to entrepreneurial opportunities. Architects of the entrepreneurship ecosystems (entrepreneurs, mentors, policymakers and consumers,) should anticipate these dips, thus capitalizing on the opportunities they create.

The need for effective strategies to enable local entrepreneurship support ecosystems is a practical one. Better understanding of the actual ecosystems provides a framework within which policy makers can ask relevant questions, envisage more efficient approaches, and assess ensuing outcomes.
Elaborate

Tell them – Policymakers should study the scenario and take into account the following points whilst they formulate policies and regulations that enable successful entrepreneurship support ecosystems.

- We need to review our attitude towards failures and accept them as learning experiences.
- We must encourage the educated to become entrepreneurs and provide students in schools and colleges with entrepreneurship skills.
- Universities, research labs and the government need to play the role of enablers in the entrepreneurship support ecosystem.
- Policymakers need to focus on reducing the obstacles such as corruption, red tape and bureaucracy.
- We need to improve our legal systems and court international venture capital firms and bring them to India.
- We must devise policies and methods to reach the secondary and tertiary towns in India, where people do not have access to the same resources available in the cities.

Today, there is a huge opportunity in this country to introduce innovative solutions that are capable of scaling up, and collaborating within the ecosystem as well as enriching it.

Say

- Now tell the participants about the Make in India Campaign.

Elaborate

Tell them – Every entrepreneur has certain needs. Some of their important needs are:

- To easily get loans
- To easily find investors
- To get tax exemptions
- To easily access resources and good infrastructure
- To enjoy a procedure that is free of hassles and is quick
Entrepreneurship and Risk

Entrepreneurs are inherently risk takers. They are path-makers not path-takers. Unlike a normal, cautious person, an entrepreneur would not think twice about quitting his job (his sole income) and taking a risk on himself and his idea.

An entrepreneur is aware that while pursuing his dreams, assumptions can be proven wrong and unforeseen events may arise. He knows that after dealing with numerous problems, success is still not guaranteed. Entrepreneurship is synonymous with the ability to take risks. This ability, called risk-appetite, is an entrepreneurial trait that is partly genetic and partly acquired.

What is Risk Appetite?

Risk appetite is defined as the extent to which a company is equipped to take risk, in order to achieve its objectives. Essentially, it refers to the balance, struck by the company, between possible profits and the hazards caused by changes in the environment (economic ecosystem, policies, etc.). Taking on more risk may lead to higher rewards but have a high probability of losses as well. However, being too conservative may go against the company as it can miss out on good opportunities to grow and reach their objectives.

The levels of risk appetite can be broadly categorized as “low”, “medium” and “high.” The company’s entrepreneur(s) have to evaluate all potential alternatives and select the option most likely to succeed. Companies have varying levels of risk appetites for different objectives. The levels depend on:

- The type of industry
- Market pressures
- Company objectives

For example, a startup with a revolutionary concept will have a very high risk appetite. The startup can afford short term failures before it achieves longer term success. This type of appetite will not remain constant and will be adjusted to account for the present circumstances of the company.
**Trainer’s Note:** These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 303 and explain trainees’ the concept.

**Say**

- Now tell the participants about the Success and Failures. Understanding Successes and Failures in Entrepreneurship.

**Elaborate**

Tell them – Shyam is a famous entrepreneur, known for his success story. But what most people don’t know, is that Shyam failed numerous times before his enterprise became a success. Read his interview to get an idea of what entrepreneurship is really about, straight from an entrepreneur who has both, failed and succeed.

**Interviewer:** Shyam, I have heard that entrepreneurs are great risk-takers who are never afraid of failing. Is this true?

**Shyam:** Ha ha, no of course it’s not true! Most people believe that entrepreneurs need to be fearlessly enthusiastic. But the truth is, fear is a very normal and valid human reaction, especially when you are planning to start your own business! In fact, my biggest fear was the fear of failing. The reality is, entrepreneurs fail as much as they succeed. The trick is to not allow the fear of failing to stop you from going ahead with your plans. Remember, failures are lessons for future success!

**Interviewer:** What, according to you, is the reason that entrepreneurs fail?

**Shyam:** Well, there is no one single reason why entrepreneurs fail. An entrepreneur can fail due to numerous reasons. You could fail because you have allowed your fear of failure to defeat you. You could fail because you are unwilling to delegate (distribute) work. As the saying goes, “You can do anything, but not everything!” You could fail because you gave up too easily – maybe you were not persistent enough. You could fail because you were focusing your energy on small, insignificant tasks and ignoring the tasks that were most important. Other reasons for failing are partnering with the wrong people, not being able to sell your product to the right customers at the right time at the right price… and many more reasons!

**Interviewer:** As an entrepreneur, how do you feel failure should be looked at?

**Shyam:** I believe we should all look at failure as an asset, rather than as something negative. The way I see it, if you have an idea, you should try to make it work, even if there is a chance that you will fail. That’s because not trying is failure right there, anyway! And failure is not the worst thing that can happen. I think having regrets because of not trying, and wondering ‘what if’ is far worse than trying and actually failing.

**Interviewer:** How did you feel when you failed for the first time?

**Shyam:** I was completely heartbroken! It was a very painful experience. But the good news is, you do recover from the failure. And with every subsequent failure, the recovery process gets a lot easier. That’s because you start to see each failure more as a lesson that will eventually help you succeed, rather than as an obstacle that you cannot overcome. You will start to realize that failure has many benefits.

**Interviewer:** Can you tell us about some of the benefits of failing?

**Shyam:** One of the benefits that I have experienced personally from failing is that the failure made me see things in a new light. It gave me answers that I didn’t have before. Failure can make you a lot stronger. It also helps keep your ego in control.
Interviewer: What advice would you give entrepreneurs who are about to start their own enterprises?

Shyam: I would tell them to do their research and ensure that their product is something that is actually wanted by customers. I’d tell them to pick their partners and employees very wisely and cautiously. I’d tell them that it’s very important to be aggressive – push and market your product as aggressively as possible. I would warn them that starting an enterprise is very expensive and that they should be prepared for a situation where they run out of money.

I would tell them to create long term goals and put a plan in action to achieve that goal. I would tell them to build a product that is truly unique. Be very careful and ensure that you are not copying another startup. Lastly, I’d tell them that it’s very important that they find the right investors.

Interviewer: That’s some really helpful advice, Shyam! I’m sure this will help all entrepreneurs to be more prepared before they begin their journey! Thank you for all your insight!

Notes for Facilitation

• Summarise the main points of the unit.
• Ask participants if they have any doubts. Encourage them to ask questions.
• Answer their queries satisfactorily.
• Ask them to answer the questions at the end of unit given in the participant’s manual.
• Ensure that every participant answer all questions.
UNIT 13.6: Preparing to be an Entrepreneur

Unit Objectives

At the end of the unit, students will be able to:
1. Discuss how market research is carried out
2. Describe the 4 Ps of marketing
3. Discuss the importance of idea generation
4. Recall basic business terminology
5. Discuss the need for CRM
6. Discuss the benefits of CRM
7. Discuss the need for networking
8. Discuss the benefits of networking
9. Understand the importance of setting goals
10. Differentiate between short-term, medium-term and long-term goals
11. Discuss how to write a business plan
12. Explain the financial planning process
13. Discuss ways to manage your risk
14. Describe the procedure and formalities for applying for bank finance
15. Discuss how to manage your own enterprise
16. List important questions that every entrepreneur should ask before starting an enterprise

Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- PC with LCD Projector or Flip Chart.
- Participant Manual.
- Copies of Handouts.

Do

- Greet and welcome the participants to the next session of the program.
- Before starting the session ask them do they have any doubts pertaining to the previous unit.
- Acknowledge their responses and clear their doubts if any.
- Tell them they will learn about Preparing to be an Entrepreneur.
Elaborate

Understanding Market Research
Market research is the process of gathering, analyzing and interpreting market information on a product or service that is being sold in that market. It also includes information on:

- Past, present and prospective customers
- Customer characteristics and spending habits
- The location and needs of the target market
- The overall industry
- Relevant competitors

Market research involves two types of data:

- Primary information. This is research collected by yourself or by someone hired by you.
- Secondary information. This is research that already exists and is out there for you to find and use.

Primary research
Primary research can be of two types:

- Exploratory: This is open-ended and usually involves detailed, unstructured interviews.
- Specific: This is precise and involves structured, formal interviews. Conducting specific research is the more expensive than conducting exploratory research.

Secondary research
Secondary research uses outside information. Some common secondary sources are:

- Public sources: These are usually free and have a lot of good information. Examples are government departments, business departments of public libraries etc.
- Commercial sources: These offer valuable information but usually require a fee to be paid. Examples are research and trade associations, banks and other financial institutions etc.
- Educational institutions: These offer a wealth of information. Examples are colleges, universities, technical.

Say

- Tell the participants about the 4 Ps of marketing.
Elaborate
Tell them – The 4 Ps of marketing are:
• Product,
• Price,
• Promotion and
• Place.
Let’s look at each of these 4 Ps in detail.
Trainer’s Note: These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 307 and explain trainees’ the concept.

Say
• Tell the participants about the Business entity concepts. If your aim is to start and run a business, it is crucial that you have a good understanding of basic business terms.

Elaborate
Tell them – Every entrepreneur should be well versed in the following terms:
• Accounting: A systematic method of recording and reporting financial transactions.
• Accounts payable: Money owed by a company to its creditors.
• Accounts Receivable: The amount a company is owed by its clients.
• Assets: The value of everything a company owns and uses to conduct its business.
• Balance Sheet: A snapshot of a company’s assets, liabilities and owner’s equity at a given moment.
Trainer’s Note: These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 309 and explain trainees’ the concept.

Say
• Tell the participants about the CRM. CRM stands for Customer Relationship Management. Originally the expression Customer Relationship Management meant managing one’s relationship with customers. However, today it refers to IT systems and software designed to help companies manage their relationships.
Elaborate

The Need for CRM

The better a company can manage its relationships with its customers, the higher the chances of the company’s success. For any entrepreneur, the ability to successfully retain existing customers and expand the enterprise is paramount. This is why IT systems that focus on addressing the problems of dealing with customers on a daily basis are becoming more and more in demand.

Customer needs change over time, and technology can make it easier to understand what customers really want. This insight helps companies to be more responsive to the needs of their customers. It enables them to modify their business operations when required, so that their customers are always served in the best manner possible. Simply put, CRM helps companies recognize the value of their clients and enables them to capitalize on improved customer relations.

Benefits of CRM

CRM has a number of important benefits:

- It helps improve relations with existing customers which can lead to:
  - Increased sales
  - Identification of customer needs
  - Cross-selling of products
  - It results in better marketing of one’s products or services
  - It enhances customer satisfaction and retention
  - It improves profitability by identifying and focusing on the most profitable customers

Say

- Tell the participants about the Networking. In business, networking means leveraging your business and personal connections in order to bring in a regular supply of new business. This marketing method is effective as well as low cost. It is a great way to develop sales opportunities and contacts.

Elaborate

Tell them – Networking can be based on referrals and introductions, or can take place via phone, email, and social and business networking websites.

The Need for Networking

Networking is an essential personal skill for business people, but it is even more important for entrepreneurs. The process of networking has its roots in relationship building. Networking results in greater communication and a stronger presence in the entrepreneurial ecosystem. This helps build strong relationships with other entrepreneurs.

Business networking events held across the globe play a huge role in connecting like-minded entrepreneurs who share the same fundamental beliefs in communication, exchanging ideas and converting ideas into realities. Such networking events also play a crucial role in connecting entrepreneurs with potential investors.
may have vastly different experiences and backgrounds but they all have a common goal in mind – they all seek connection, inspiration, advice, opportunities and mentors. Networking offers them a platform to do just that.

Benefits of Networking

Networking offers numerous benefits for entrepreneurs. Some of the major benefits are:

- Getting high quality leads
- Increased business opportunities
- Good source of relevant connections
- Advice from like-minded entrepreneurs
- Gaining visibility and raising your profile
- Meeting positive and enthusiastic people
- Increased self-confidence
- Satisfaction from helping others
- Building strong and lasting friendships

Say

• Tell the participants about the Business Plans. Setting goals is important because it gives you long-term vision and short-term motivation. Goals can be short term, medium term and long term.

Elaborate

Tell them – Short-Term Goals

- These are specific goals for the immediate future. Example: Repairing a machine that has failed. Medium-Term Goals
- These goals are built on your short term goals.
- They do not need to be as specific as your short term goals.

Example: Arranging for a service contract to ensure that your machines don’t fail again.

Long-Term Goals

These goals require time and planning. They usually take a year or more to achieve.

Example: Planning your expenses so you can buy new machinery

Why Create a Business Plan

A business plan is a tool for understanding how your business is put together. It can be used to monitor progress, foster accountable and control the fate of the business. It usually offers a 3-5 year projection and outlines the plan that the company intends to follow to grow its revenues. A business plan is also a very important tool for getting the interest of key employees or future investors. A business plan typically comprises of eight elements.
Tell the participants about the Elements of a Business Plans. The executive summary follows the title page. The summary should clearly state your desires as the business owner in a short and business like way. It is an overview of your business and your plans. Ideally this should not be more than 1-2 pages.

Tell them – Your Executive Summary should include:

- The Mission Statement: Explain what your business is all about.
- Example: Nike’s Mission Statement
  Nike’s mission statement is “To bring inspiration and innovation to every athlete in the world.”
- Company Information: Provide information like when your business was formed, the names and roles of the founders, the number of employees, your business location(s) etc.
- Growth Highlights: Mention examples of company growth. Use graphs and charts where possible.
- Your Products/Services: Describe the products or services provided.
- Financial Information: Provide details on current bank and investors.
- Summarize future plans: Describe where you see your business in the future.

**Trainer’s Note:** These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 302 and explain trainees’ the concept.

Tell the participants what Information Should Entrepreneurs Offer Banks for Funding. When approaching a bank, entrepreneurs must have a clear idea of the different criteria that banks use to screen, rate and process loan applications. Entrepreneurs must also be aware of the importance of providing banks with accurate and correct information.

Tell them – It is now easier than ever for financial institutions to track any default behaviour of loan applicants. Entrepreneurs looking for funding from banks must provide banks with information relating to their general credentials, financial situation and guarantees or collaterals that can be offered.

**General Credentials**

This is where you, as an entrepreneur, provide the bank with background information on yourself. Such information includes:

- **Letter(s) of Introduction:** This letter should be written by a respected business person who knows you well enough to introduce you. The aim of this letter is set across your achievements and vouch for your character and integrity.
• **Your Profile:** This is basically your resume. You need to give the bank a good idea of your educational achievements, professional training, qualifications, employment record and achievements.

• **Business Brochure:** A business brochure typically provides information on company products, clients, how long the business has been running for etc.

• **Bank and Other References:** If you have an account with another bank, providing those bank references is a good idea.

• **Proof of Company Ownership or Registration:** In some cases, you may need to provide the bank with proof of company ownership and registration. A list of assets and liabilities may also be required.

**Financial Situation**

Banks will expect current financial information on your enterprise. The standard financial reports you should be prepared with are:

• Balance Sheet
• Profit-and-Loss Account
• Cash-Flow Statement
• Projected Sales and Revenues
• Business Plan
• Feasibility Study

**Guarantees or Collaterals**

Usually banks will refuse to grant you a loan without security. You can offer assets which the bank can seize and sell off if you do not repay the loan. Fixed assets like machinery, equipment, vehicles etc. are also considered to be security for loans.

---

**Say**

• Tell the participants about the landing criteria of banks.

---

**Elaborate**

Tell them – Your request for funding will have a higher chance of success if you can satisfy the following lending criteria:

• Good cash flow
• Adequate shareholders’ funds
• Adequate security
• Experience in business
• Good reputation

**The Procedure**

To apply for funding the following procedure will need to be followed.
• Submit your application form and all other required documents to the bank.
• The bank will carefully assess your credit worthiness and assign ratings by analyzing your business information with respect to parameters like management, financial, operational and industry information as well as past loan performance.
• The bank will make a decision as to whether or not you should be given funding.

Say

• Tell the participants about the Enterprise Management. To manage your enterprise effectively you need to look at many different aspects, right from managing the day-to-day activities to figuring out how to handle a large scale event.

Elaborate

Tell them – Let’s take a look at some simple steps to manage your company effectively.

Step 1: Use your leadership skills and ask for advice when required.
Step 2: Divide your work amongst others – realize that you cannot handle everything yourself.
Step 3: Hire the right people for the job.
Step 4: Motivate your employees and train them well.
Step 5: Train your people to handle your customers well.
Step 6: Market your enterprise effectively.

Trainer’s Note: These are supporting content to the Participant Manual, please adhere to the Participant Manual, Page No. 307 and explain trainees' the concept.

Say

• Tell the participants about Considering Entrepreneurship.

Elaborate

• Tell them – Questions to Ask Yourself before Considering Entrepreneurship:
  • Why am I starting a business?
  • What problem am I solving?
• Have others attempted to solve this problem before? Did they succeed or fail?
• Do I have a mentor or industry expert that I can call on?
• Who is my ideal customer?
• Who are my competitors?
• What makes my business idea different from other business ideas?
• What are the key features of my product or service?
• Have I done a SWOT analysis?
• What is the size of the market that will buy my product or service?
• What would it take to build a minimum viable product to test the market?
• How much money do I need to get started?
• Will I need to get a loan?
• How soon will my products or services be available?
• When will I break even or make a profit?
• How will those who invest in my idea make a profit?
• How should I set up the legal structure of my business?
• What taxes will I need to pay?
• What kind of insurance will I need?
• Have I reached out to potential customers for feedback

Notes for Facilitation

• Summarise the main points of the unit.
• Ask participants if they have any doubts. Encourage them to ask questions.
• Answer their queries satisfactorily.
• Ask them to answer the questions at the end of unit given in the participant’s manual.
• Ensure that every participant answer all questions.
14. Annexures

Annexure I: Training Delivery Plan
Annexure II: Assessment Criteria
## Training Delivery Plan

<table>
<thead>
<tr>
<th>Program Name:</th>
<th>Fitter Mechanical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualification Pack Name &amp; Ref. ID</td>
<td>Fitter Mechanical &amp; LFS/Q0213</td>
</tr>
<tr>
<td>Version No.</td>
<td>1.0</td>
</tr>
<tr>
<td>Version Update Date</td>
<td>28/12/2015</td>
</tr>
<tr>
<td>Pre-requisites to Training</td>
<td>1. On the job training, welding experience preferred</td>
</tr>
<tr>
<td>Training Outcomes</td>
<td>By the end of this program, the participants will be able to:</td>
</tr>
<tr>
<td></td>
<td>2. Perform fitting and assembly operations on metal components</td>
</tr>
<tr>
<td></td>
<td>3. Perform maintenance activities on mechanical equipment / machines</td>
</tr>
<tr>
<td></td>
<td>4. Coordinate with shift supervisor, cross functional teams and within the team</td>
</tr>
<tr>
<td></td>
<td>5. Maintain a healthy, safe and secure working environment in the life sciences facility</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Module Name</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 1.     | Introduction                                                                 | Life Sciences Industry and Drug Regulatory Authorities for life Sciences Sector | 1. Explain the brief outline of Life Sciences industry and its sub-sectors  
2. Gain Knowledge about Regulatory authorities and follow the rules and regulations as you will understand their impact on manufacturing in Life Sciences industry in India | Bridge Module                  | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals Images          | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.                                      | 5:00 hrs.                       |
|        | Standards for Manufacturing in Life Sciences                                  |                                                                               | 1. Explain the good manufacturing practices and their importance  
2. Explain the good laboratory practices and their importance  
3. Gain knowledge about pharmacopeia and use pharmacopeia and read monograph | Bridge Module                  | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals Images          | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.                                      | 5:00 hrs.                       |
|        | Role of Fitter in Industry                                                   |                                                                               | 1. List the role of fitter in industry  
2. Know about personal attributes and knowledge requirements of fitter in industry | Bridge Module                  | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals Images          | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.                                      | 5:00 hrs.                       |
|        | 2. Occupational Health and Safety                                            | Learn Occupational Health and Safety                                           | 1. Discuss about health and safety requirements in industry  
2. Know about essential elements for safety  
3. Know about good safety work practices | LFS/N0101                      | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals Images          | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.                                      | 1:30 hr.                        |
|        |Hazards                                                                       |                                                                               | 1. Know about hazards and different types of hazards  
2. Know about, how to identify and control hazards | LFS/N0101                      | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals Images          | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.                                      | 1:00 hr.                        |
|        |Safe Working Practices                                                        |                                                                               | 1. Know about safe working practices  
2. Know about clean room practices | LFS/N0101                      | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals Images          | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.                                      | 1:00 hr.                        |
|        |Personal Protective Equipment (PPE)                                           |                                                                               | 1. Discuss about PPE  
2. Know about different types of PPE  
3. Know about utility of PPE  
4. Learn the use of PPE | LFS/N0101                      | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals Images          | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.                                      | 1:00 hr.                        |
<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Materials</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safe Working at Heights</strong></td>
<td>1. Discuss about risks of working at heights 2. Know about safety precautions while working at heights</td>
<td>LFS/N0101 PC2, PC7, KA2, KB23</td>
<td>2:00 hrs.</td>
</tr>
<tr>
<td><strong>Weight Handling Practices</strong></td>
<td>1. Discuss about safe manual weight lifting practices 2. Know about heavy weight lifting equipment</td>
<td>LFS/N0101 PC2, PC7, PC8, KA2, KB14</td>
<td>2:00 hrs.</td>
</tr>
<tr>
<td><strong>House Keeping</strong></td>
<td>1. Discuss about safety issues in the industry 2. Know about housekeeping issues in the industry</td>
<td>LFS/N0101 PC2, PC3, PC7, KA2, KA3, KB3, KB23</td>
<td>1:30 hr.</td>
</tr>
<tr>
<td><strong>5S Safety System</strong></td>
<td>1. Know about 5S safety system 2. Discuss about essential elements housekeeping 3. Discuss about good housekeeping practices</td>
<td>LFS/N0101 PC1, PC2, PC3, PC4, KA2, KB23</td>
<td>1:30 hr.</td>
</tr>
<tr>
<td><strong>Waste Management</strong></td>
<td>1. Discuss about waste management 2. Know about importance of waste management 3. Know about waste management methods</td>
<td>LFS/N0101 PC1, PC4, KA2, KA3, KB23</td>
<td>1:30 hr.</td>
</tr>
<tr>
<td><strong>Fire Safety Practices</strong></td>
<td>1. Fire safety practices 2. Use of fire extinguishers 3. Emergency procedures and rescue techniques 4. First-aid procedures</td>
<td>LFS/N0101 PC5, PC8, KA2</td>
<td>1:00 hr.</td>
</tr>
<tr>
<td><strong>Use of Fire Extinguishers</strong></td>
<td>1. Discuss about fire extinguishers 2. Know about types of fire extinguishers 3. Know about how to use fire extinguishers</td>
<td>LFS/N0101 PC5, PC8, KA2,</td>
<td>1:00 hr.</td>
</tr>
<tr>
<td><strong>Emergency Procedures and Rescue Techniques</strong></td>
<td>1. Discuss about emergency procedures 2. Know about fire drills 3. Know about rescuing person in emergency</td>
<td>LFS/N0101 PC10, KA2</td>
<td>1:00 hr.</td>
</tr>
<tr>
<td><strong>First Aid Procedures</strong></td>
<td>1. Know about basic first aid techniques during electric shock, burns and choking 2. Deliver product detailing to doctor 3. Handle objections raised by doctor</td>
<td>LFS/N0101 PC10, KA2</td>
<td>1:00 hr.</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Code</td>
<td>Notes</td>
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</tr>
<tr>
<td>5. Preparing for Machining, Fitting and Assembling Operation</td>
<td>Limits, Fits and Tolerances</td>
<td>LFS/N0101 PC10, KA2</td>
<td>Practical Lab Note Pad, Pen, charts</td>
</tr>
<tr>
<td></td>
<td>1. Understand the basic deviation, tolerance and tolerance grades</td>
<td>LFS/N0260 PC6, KA1, KB2, KB8</td>
<td>Power-point presentation Facilitator-led discussion Audio-visuals Images</td>
</tr>
<tr>
<td></td>
<td>2. Know about transition fit, limits and system for limits and fits</td>
<td>LFS/N0260 PC6, KA1, KB2, KB8</td>
<td>Practical Lab Note Pad, Pen, charts</td>
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<tr>
<td></td>
<td>3. Demonstrate basic deviation, tolerance and tolerance grades</td>
<td>LFS/N0260 PC6, KA1, KB2, KB8</td>
<td>Note Pad, Pen, charts</td>
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<tr>
<td>5. Preparing for Machining, Fitting and Assembling Operation</td>
<td>Understanding the Engineering Drawings</td>
<td>LFS/N0260 PC6, KA1, KB2, KB12</td>
<td>Power-point presentation Facilitator-led discussion Audio-visuals Images</td>
</tr>
<tr>
<td></td>
<td>1. Discuss about basics of engineering drawing</td>
<td>LFS/N0260 PC6, KA1, KB2, KB12</td>
<td>Note Pad, Pen, charts</td>
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<td>2. Know about orthographic projection views</td>
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<td>3. Know about concept of quadrants</td>
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<td>4. Discuss about engineering standards</td>
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<td>5. Discuss about tools require for engineering drawing</td>
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<td>6. Gain practical knowledge on basics of engineering drawing, orthographic projection views, concept of quadrants</td>
<td>LFS/N0260 PC6, KA1, KB2, KB12</td>
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<td>7. Gain Hands-on experience on tools require for engineering drawing</td>
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<tr>
<td>5. Preparing for Machining, Fitting and Assembling Operation</td>
<td>Accessories, Equipment and Parts for Assembling</td>
<td>LFS/N0260 PC7, PC8, KA1, KB11</td>
<td>Power-point presentation Facilitator-led discussion Audio-visuals Images</td>
</tr>
<tr>
<td></td>
<td>1. Identify equipment require for assembling</td>
<td>LFS/N0260 PC7, PC8, KA1, KB11</td>
<td>Note Pad, Pen, charts</td>
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<td></td>
<td>2. Identify accessories require for assembling</td>
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<td>3. Know about parts require for assembling</td>
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<td>4. Gain practical understanding on equipment, accessories and parts required for assembling</td>
<td>LFS/N0260 PC7, PC8, KA1, KB11</td>
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<tr>
<td>5. Preparing for Machining, Fitting and Assembling Operation</td>
<td>Using of Measuring Instruments</td>
<td>LFS/N0260 PC9, KA1, KB19</td>
<td>Power-point presentation Facilitator-led discussion Audio-visuals Images</td>
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<td>1. Gain knowledge about different measuring instruments</td>
<td>LFS/N0260 PC9, KA1, KB19</td>
<td>Note Pad, Pen, charts</td>
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<td>2. Know about how to use measuring instruments properly</td>
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<td>3. Identify different measuring instruments and specific uses</td>
<td>LFS/N0260 PC9, KA1, KB19</td>
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<tr>
<td>5. Preparing for Machining, Fitting and Assembling Operation</td>
<td>6. Marking Out of Components</td>
<td>LFS/N0260 PC10, PC12, KA1, KB3, KB4, KB5</td>
<td>Power-point presentation Facilitator-led discussion Audio-visuals Images</td>
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<td></td>
<td>1. Know about basics of marking out</td>
<td>LFS/N0260 PC10, PC12, KA1, KB3, KB4, KB5</td>
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<td>2. Know about methods of marking out</td>
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<td>Modular No.</td>
<td>Subject</td>
<td>Session Details</td>
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</table>
| 7.1.1      | **Fitting operations**                       | **Filing** 1. Know about files 2. Discuss about features of files 3. Know about how to use files properly  
LFS/N0260  
PC16, KA4, KB8, KB13  
• Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.  
1:00 hrs.  
**Sawing** 1. Know about sawing 2. Discuss about features of hacksaw 3. Know about how to use hacksaw properly  
LFS/N0260  
PC16, KA4, KB8  
• Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.  
1:00 hrs.  
**Drilling and Reaming** 1. Know about drilling operation 2. Discuss about types of drills 3. Know about reaming and types of reamers  
LFS/N0260  
PC17, KA4, KB8 KB9  
• Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.  
1:00 hrs.  
**Threading** 1. Know about threading operation 2. Discuss about tapping 3. Discuss about stocking and dieing  
LFS/N0260  
PC17, KA4, KB9, KB11  
• Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.  
1:00 hrs. |
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<tr>
<th>Section</th>
<th>Activities</th>
<th>Objectives</th>
<th>Available Objects</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>Grinding</td>
<td>1. Know about grinding 2. Discuss about different types of grinders 3. Know about how to use grinders</td>
<td>LFS/N0260 PC17, KA4, KB14, KB15, KB16, KB17</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
<td>2.00 hrs.</td>
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<tr>
<td>Work holding Devices</td>
<td>1. Know about Workholding devices 2. Discuss about different types of Workholding devices 3. Know about how to use workholding devices</td>
<td>LFS/N0260 PC15, PC17, KA4, KB14</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
<td>3.00 hrs.</td>
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<tr>
<td>Assembling Operations</td>
<td>1. Discuss about threaded fasteners 2. Know about riveting 3. Know about circlips</td>
<td>LFS/N0260 PC18, PC20, KA4, KB11, KB12</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
<td>2.00 hrs.</td>
</tr>
<tr>
<td>Jointing Techniques</td>
<td>1. Know about torque tightening 2. Discuss about welding 3. Perform brazing and soldering 4. Know about adhesive jointing</td>
<td>LFS/N0260 PC18, PC19, PC20, KA4, KB8</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
<td>3.00 hrs.</td>
</tr>
<tr>
<td>Assembling Procedure</td>
<td>1. Know about assembling procedure</td>
<td>LFS/N0260 PC18, PC19, PC20, PC21, PC22, PC24, PC25, KA4, KB11</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
<td>1.00 hrs.</td>
</tr>
<tr>
<td>Maintenance and Repair</td>
<td>1. Know about resource degradation 2. Know about types of resource degradation</td>
<td>LFS/N0261 PC1, PC4, PC8, PC9, KB8, KB3, KB9, KB10, KB18, KB32</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
<td>8.00 hrs.</td>
</tr>
<tr>
<td>Maintenance in Life Science Sector</td>
<td>1. Know about resource degradation 2. Know about types of resource degradation</td>
<td>LFS/N0261 PC1, PC4, PC8, PC9, KB8, KB3, KB13</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
<td>8.00 hrs.</td>
</tr>
<tr>
<td>10. Quality Check and Testing</td>
<td>1. Discuss about importance of quality checks</td>
<td>LFS/N0261 PC26, PC27, KA2 KB2, KB3, KB7, KB8, KB20, KB21, KB24, KB25 KB35, KB36</td>
<td>• Practice quality checking LFS/N0261 PC26, PC27, KA2 KB2, KB3, KB7, KB8, KB20, KB21, KB24, KB25 KB35, KB36</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
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<td>1. Know about different types of inspection tests</td>
<td>LFS/N0261 PC26, PC27, KA2 KB2, KB3, KB7, KB8, KB20, KB21, KB24, KB25 KB35, KB36</td>
<td>• Gain practical understanding about different types of inspection tests LFS/N0261 PC26, PC27, KA2 KB2, KB3, KB7, KB8, KB20, KB21, KB24, KB25 KB35, KB36</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
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<td>1. Know about how to take the corrective actions 2. Know about how to review and report the corrective actions effectiveness to the management</td>
<td>LFS/N0261 PC28, PC29, KA2, KA3, KA4, KA5, KA6, KA7, KB2, KB3, KB7, KB24, KB25, KB37, KB38, KB39</td>
<td>• Corrective Actions taken and Review of their Effectiveness</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
</tr>
<tr>
<td>11. Risk Management and Reporting</td>
<td>1. Discuss about risk management process 2. Know about inspecting controlling and controlling the problems</td>
<td>LFS/N0204 PC1, PC2, PC4, KA1, KA2, KB1, KB2</td>
<td>• Risk Management</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
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<td>1. Know about problem management process 2. Know about escalation matrix</td>
<td>LFS/N0204 PC3, PC5, KA1, KA2, KB1, KB2</td>
<td>• Escalation Matrix</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
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<tr>
<td></td>
<td>1. Discuss about accident and incident reporting 2. Know about how to write reports properly</td>
<td>LFS/N0204 PC3, KA1, KA2, KB1, KB2</td>
<td>• Accident Reporting</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
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<td></td>
<td>1. Know about reporting of faulty and damage tools</td>
<td>LFS/N0204 PC5, KA1, KA2, KB1, KB2</td>
<td>• Defects Reporting</td>
<td>• Power-point presentation • Facilitator-led discussion • Audio-visuals • Images</td>
</tr>
</tbody>
</table>
| 12. Work Effectively with Others | Team Work | 1. Discuss about how to communicate effectively with colleagues  
2. Know about effective communication | LFS/N0204 PC7, PC8, KA1, KA2, KB1, KB2 | **Power-point presentation**  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. | 2:00 hrs. |
|  | Workplace Etiquettes | 1. Know about organization policies and procedures  
2. Know about workplace etiquettes | LFS/N0204 PC5, PC6, KA1, KA2, KB1, KB2 | **Power-point presentation**  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. | 1:00 hrs. |
|  | Personal Strengths & Value Systems | 1. Explain the meaning of health  
2. List common health issues  
3. Discuss tips to prevent common health issues  
4. Explain the meaning of hygiene  
5. Understand the purpose of Swachh Bharat Abhiyan  
6. Explain the meaning of habit  
7. Discuss ways to set up a safe work environment  
8. Discuss critical safety habits to be followed by employees  
9. Explain the importance of self-analysis  
10. Understand motivation with the help of Maslow’s Hierarchy of Needs  
11. Discuss the meaning of achievement motivation  
12. List the characteristics of entrepreneurs with achievement motivation  
13. List the different factors that motivate you  
14. Discuss how to maintain a positive attitude  
15. Discuss the role of attitude in self-analysis  
16. List your strengths and weaknesses  
17. Discuss the qualities of honest people  
18. Describe the importance of honesty in entrepreneurs  
19. Discuss the elements of a strong work ethic  
20. Discuss how to foster a good work ethic  
21. List the characteristics of highly creative people  
22. List the characteristics of highly innovative people  
23. Discuss the benefits of time management  
24. List the traits of effective time managers | Bridge Module | **Power-point presentation**  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. | 1:00 hr. |
| 25. Describe effective time management technique | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 26. Discuss the importance of anger management | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 27. Describe anger management strategies | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 28. Discuss tips for anger management | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 29. Discuss the causes of stress | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 30. Discuss the symptoms of stress | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 31. Discuss tips for stress management | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| Digital Literacy: A Recap | | | |
| 1. Identify the basic parts of a computer | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 2. Identify the basic parts of a keyboard | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 3. Recall basic computer terminology | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 4. Recall basic computer terminology | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 5. Recall the functions of basic computer keys | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 6. Discuss the main applications of MS Office | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 7. Discuss the benefits of Microsoft Outlook | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 8. Discuss the different types of e-commerce | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 9. List the benefits of e-commerce for retailers and customers | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 10. Discuss how the Digital India campaign will help boost e-commerce in India | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 11. Describe how you will sell a product or service on an e-commerce platform | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| Money Matters | | | |
| 1. Discuss the importance of saving money | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 2. Discuss the benefits of saving money | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 3. Discuss the main types of bank accounts | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 4. Describe the process of opening a bank account | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 5. Differentiate between fixed and variable costs | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 6. Describe the main types of investment options | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 7. Describe the different types of insurance products | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 8. Describe the different types of taxes | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 9. Discuss the uses of online banking | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 10. Discuss the main types of electronic funds transfers | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| Preparing for Employment and Self Employment | | | |
| 1. Discuss the steps to prepare for an interview | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 2. Discuss the steps to create an effective Resume | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
| 3. Discuss the most frequently asked interview questions | Bridge Module | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc. |
<table>
<thead>
<tr>
<th>Understanding Entrepreneurship</th>
<th>Bridge Module</th>
<th>Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.</th>
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<tbody>
<tr>
<td>1. Discuss the concept of entrepreneurship</td>
<td>• Power-point presentation</td>
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<tr>
<td>2. Discuss the importance of entrepreneurship</td>
<td>• Facilitator- led discussion</td>
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<tr>
<td>3. Describe the characteristics of an entrepreneur</td>
<td>• Audio- visuals</td>
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<tr>
<td>4. Describe the different types of enterprises</td>
<td>• Images</td>
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<tr>
<td>5. List the qualities of an effective leader</td>
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<td>6. Discuss the benefits of effective leadership</td>
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<td>7. List the traits of an effective team</td>
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<td>8. Discuss the importance of listening effectively</td>
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<td>9. Discuss how to listen effectively</td>
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<td>10. Discuss the importance of speaking effectively</td>
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<td>11. Discuss how to speak effectively</td>
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<td>12. Discuss how to solve problems</td>
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<td>13. List important problem solving traits</td>
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<td>14. Discuss ways to assess problem solving skills</td>
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<td>15. Discuss the importance of negotiation</td>
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<td>16. Discuss how to negotiate</td>
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<td>17. Discuss how to identify new business opportunities</td>
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<td>18. Discuss how to identify business opportunities within your business</td>
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<td>19. Understand the meaning of entrepreneur</td>
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<td>20. Describe the different types of entrepreneurs</td>
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<td>21. List the characteristics of entrepreneurs</td>
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<td>22. Recall entrepreneur success stories</td>
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<td>23. Discuss the entrepreneurial process</td>
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<td>24. Describe the entrepreneurship ecosystem</td>
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<td>25. Discuss the government’s role in the entrepreneurship ecosystem</td>
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<td>26. Discuss the current entrepreneurship ecosystem in India</td>
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<td>27. Understand the purpose of the Make in India campaign</td>
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</tr>
<tr>
<td>28. Discuss the relationship between entrepreneurship and risk appetite</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
29. Discuss the relationship between entrepreneurship and resilience  
30. Describe the characteristics of a resilient entrepreneur  
31. Discuss how to deal with failure  

<table>
<thead>
<tr>
<th>Preparing to be an Entrepreneur</th>
<th>Bridge Module</th>
<th>Available Objects such as a book, pen, duster, white board, marker, Computer, Projector etc.</th>
</tr>
</thead>
</table>
| 1. Discuss how market research is carried out  
2. Describe the 4 Ps of marketing  
3. Discuss the importance of idea generation  
4. Recall basic business terminology  
5. Discuss the need for CRM  
6. Discuss the benefits of CRM  
7. Discuss the need for networking  
8. Discuss the benefits of networking  
9. Understand the importance of setting goals  
10. Differentiate between short-term, medium-term and long-term goals  
11. Discuss how to write a business plan  
12. Explain the financial planning process  
13. Discuss ways to manage your risk  
14. Describe the procedure and formalities for applying for bank finance  
15. Discuss how to manage your own enterprise  
16. List important questions that every entrepreneur should ask before starting an enterprise | • Power-point presentation  
• Facilitator-led discussion  
• Audio-visuals  
• Images | Total Duration 160 hrs. |
## Assessment Criteria

### CRITERIA FOR ASSESSMENT OF TRAINEES

<table>
<thead>
<tr>
<th>Assessment Criteria for Fitter Mechanical – Life Sciences</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Role</td>
<td>Fitter Mechanical</td>
</tr>
<tr>
<td>Qualification Pack</td>
<td>LFS/Q0213</td>
</tr>
<tr>
<td>Sector Skill Council</td>
<td>Life Sciences Sector Skill Development Council</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Guidelines for Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.</td>
</tr>
<tr>
<td>2</td>
<td>The assessment for the theory part will be based on knowledge bank of questions created by the SSC.</td>
</tr>
<tr>
<td>3</td>
<td>Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)</td>
</tr>
<tr>
<td>4</td>
<td>Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria</td>
</tr>
<tr>
<td>5</td>
<td>To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS</td>
</tr>
<tr>
<td>6</td>
<td>In case of successfully passing only certain number of NOS’s, the trainee is eligible to take subsequent assessment on the balance NOS’s to pass the Qualification Pack.</td>
</tr>
</tbody>
</table>

### Marks Allocation

<table>
<thead>
<tr>
<th>Assessment Outcome</th>
<th>Assessment Criteria of Outcomes</th>
<th>Total Marks (400)</th>
<th>Out Of</th>
<th>Marks Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFS/ N 0260 (Perform fitting and assembly operations on metal components)</td>
<td>PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work</td>
<td>100</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing broaching operations</td>
<td></td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>PC3. ensure work area is clean and safe from hazards</td>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition</td>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>PC5. ensure that all machines and machine tools are secured at all times</td>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>PC6. determine job requirement from job specification documents obtained from valid sources</td>
<td></td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>PC7. establish the procedures to complete the general machining, fitting or assembling operations</td>
<td></td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PC8.</strong> obtain the appropriate equipment, parts and accessories for the general machining, fitting or assembling operation</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>PC9.</strong> check that all measuring equipment is within calibration date</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>PC10.</strong> prepare/determine suitable datums from which to mark out (eg. choosing a machine face or filing a flat face as a datum)</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>PC11.</strong> apply a marking medium to enhance clarity of the marking out</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>PC12.</strong> use an appropriate method of marking out (eg. direct marking using instruments, use of templates or tracing/transfer methods)</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>PC13.</strong> use a range of marking out equipment (eg. rules, squares, scribers, vernier instruments)</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>PC14.</strong> mark out a range of features</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>PC15.</strong> cut and shape the materials to the required specification, using appropriate tools and techniques</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>PC16.</strong> use a range of hand fitting methods for fitting operations</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>PC17.</strong> Use a range of manually operated machines for performing machining operations</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>PC18.</strong> use appropriate methods and techniques to assemble and secure the components and sub-assemblies in their correct positions</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>PC19.</strong> drill, tap and ream locating holes as required to permanently locate components</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>PC20.</strong> fasten components permanently using methods such as using engineered fasteners, applying adhesives, soldering and brazing</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>PC21.</strong> produce mechanical assemblies as per job specifications</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Requirement</td>
<td>Score</td>
<td>Level 1</td>
<td>Level 2</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>PC22. dismantle mechanical assemblies without damage to components and/or subassemblies</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PC23. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC24. keep the work area in a safe and tidy condition during and on completion of the manufacturing activities</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC25. return all tools and equipment to the correct location on completion of the fitting activities support the customer remotely over the internet to test potential solutions</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC26. perform the necessary checks for dimensional accuracy</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PC27. use the appropriate measuring equipment for checking activities</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC28. produce components within all of the applying standards</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PC29. generate stage inspection reports</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>10</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>LFS/ N 0261 (Perform maintenance activities on mechanical equipment/machinery)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC3. work following laid down procedures and instructions</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC4. ensure work area is clean and safe from hazards</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC5. ensure that all tools, equipment, power tool cables</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Extension leads are in a safe and usable condition</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC6. follow all relevant setting up and operating specifications for the products or mechanical equipment being commissioned</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC7. follow the defined procedures and set up the equipment correctly ensuring that all operating parameters are achieved</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC8. obtain job specifications and requirements from valid sources and find out the fault</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC9. obtain and interpret drawings, specifications, manufacturers’ manuals and other documents needed in the maintenance process</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC10. follow the procedure to be adopted to establish the background of the fault and the tools to be used</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC11. evaluate various types of information available for fault diagnosis</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC12. evaluate sensory information to assess likely faults eg. sound, visual</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC13. collect evidence regarding the fault from the sources using a range of diagnostic equipment and techniques</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC14. apply monitoring or testing procedures to help in the fault diagnosis using a range of test equipment</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC15. relate previous reports/records of similar fault conditions</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC16. evaluate the likely risk of running the equipment with the displayed fault, and the effects the fault could have on health and safety, and on the overall process or system</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC17. carry out the maintenance activities in the specified</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Task Description</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>PC18. carry out maintenance activities on various equipment</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PC19. perform dismantling processes mechanical equipment using appropriate method or technique in order to replace defective components</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PC20. re-assemble the components using appropriate methods, and adjust them to meet the operating specification</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PC21. carry out servicing and maintenance techniques as applicable</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PC22. replace or refit basic hydraulic and pneumatic components</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC23. identify requirements for welding, machining, electric or electronic repair and handover to the relevant personal after following due process</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC24. conduct a trial run of the equipment at full power/speed/flow</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC25. confirm that the produced component/process outcomes meet specifications</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC26. monitor and record measurements and observations</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC27. review and update maintenance procedures and plans</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC28. deal with equipment malfunction and rectify faults during the breakdown servicing process as appropriate</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC29. identify areas of improvements in the various maintenance services and implement the improvement activities agreed upon by the relevant authorities</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PC30. deal promptly and effectively with problems within their control, and seek help and</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>LFS/N0204 (Coordinate with Shift Supervisor, cross functional teams and within the team)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>guidance from the relevant people if they have problems that they cannot resolve to ensure zero idle time of machine/equipment</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PC31. leave the work area in a safe and tidy condition on completion of the manufacturing activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>12</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>PC1. understand the work output requirements</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PC2. understand the quality standards to be maintained</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PC3. proactively inform supervisor on issues requiring intervention</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PC4. comply with company policy and rule</td>
<td>13</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>PC5. deliver quality work on time and report any anticipated reasons for delay</td>
<td>13</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>PC6. be able to resolve conflicts</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PC7. multi-task relevant activities to align with team goals</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PC8. put team over individual goals</td>
<td>14</td>
<td>6</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>48</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>LFS/N0101 (Maintain a healthy, safe and secure working environment in the life sciences facility)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC1. observe and comply with the company’s current health, safety and security policies and procedures</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PC2. while carrying out work, use appropriate safety gears like head gear, masks, gloves and other accessories as mentioned in the guidelines</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PC3. report any identified breaches in health, safety, and security policies and procedures to the designated person</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PC4. responsible for maintaining discipline at the shop-floor/production area</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PC5. identify and correct any hazards that the individual can deal with safely, competently and within the limits of their authority</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
• Explain each Guideline for Assessment in detail
• Explain the score that each trainee needs to obtain
• Recapitulate each NOS one-by-one and take participants through the allocation of marks for Theory and Skills Practical.
• Explain the Allocation of Marks. Explain that they will be assessed on Theory and Skills Practical.