

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 01

Date: Week 01

Time: 1 Week

Lesson No:01

I. PREPARATION:

Title: Induction, trade orientation & 5S

1) **Objectives:** *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Whiteboard, tool samples, PPE, 5S visual board.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Trade orientation and fitter role	1. Fitter training develops skills for measuring, marking, cutting, filing, drilling, fitting, assembly and maintenance work. 2. Explain the fitter's role in preparing, fitting, finishing and maintaining engineering components. 3. Emphasise accuracy, interchangeability, safe working habits, tool care and disciplined workshop practice. 4. Relate classroom learning to workshop jobs and employability requirements.	Teaching: Trade orientation and fitter role. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Workshop tools, machines, stores and 5S	1. Identify common hand tools, measuring tools, machines, work benches and safety facilities used in the fitter shop. 2. Explain basic issue/return and care practices for tools and consumables through the ITI stores procedure. 3. Introduce 5S: Sort, Set in order, Shine, Standardize and Sustain, with examples from the workshop. 4. Demonstrate correct placement, cleaning, tagging and reporting of damaged tools/equipment.	Teaching: Workshop tools, machines, stores and 5S. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Guided workshop practice	1. Walk through the workshop and identify major work areas, tools, machines, emergency equipment and storage locations. 2. Demonstrate safe movement, correct handling of tools and proper work-bench arrangement. 3. Let trainees practise identifying tools and returning each item to its designated location. 4. Use a short checklist to verify recognition, housekeeping and correct stores practice.	Teaching: Guided workshop practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Keep aisles, benches and machine surroundings free from oil, chips, scrap and unnecessary materials. 2. Do not operate any machine without authorization, instruction and required PPE. 3. Check that tools are serviceable before use and report defects immediately. 4. Assess through observation, oral questions, 5S demonstration and correct tool-storage practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of induction, trade orientation & 5s?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Prepare a labelled list of workshop tools and 5S actions.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Safety, PPE, first aid and emergency response

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 02

Date: Week 02

Time: 1 Week

Lesson No:02

I. PREPARATION:

Title: Safety, PPE, first aid & fire

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: PPE set, safety signs, first-aid kit, fire extinguisher/trainer.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Hazards, PPE and safety signs	1. Identify mechanical, electrical, fire, chemical, ergonomic and workshop-environment hazards. 2. Select PPE according to the activity: safety shoes, eye protection, hearing protection, gloves or other specified protection. 3. Explain danger, warning, caution and mandatory/prohibition signs and their purpose. 4. Stress that PPE supplements, but does not replace, safe working methods and guards.	Teaching: Hazards, PPE and safety signs. Use demonstration, questioning and guided practice; verify the result before moving on.
2) First aid, electrical and fire safety	1. Explain immediate response to common workshop injuries and the need to call responsible personnel promptly. 2. Keep clear of exposed electrical conductors; isolate supply before attempting authorized emergency action. 3. Differentiate basic fire classes and select the appropriate extinguisher as trained. 4. Demonstrate safe extinguisher approach and emergency evacuation behaviour without taking unnecessary risk.	Teaching: First aid, electrical and fire safety. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Emergency-response practice	1. Conduct a controlled drill for identifying a hazard, raising an alarm and moving to the safe area. 2. Demonstrate inspection of PPE and recognition of damaged or unsuitable protective equipment. 3. Practise reading safety signs and locating first-aid box, extinguisher and emergency exits. 4. Use questions and role-play to reinforce correct sequence of emergency actions.	Teaching: Emergency-response practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Never touch live electrical parts or use damaged electrical equipment. 2. Do not obstruct exits, fire equipment or first-aid facilities. 3. Keep combustible material away from ignition sources and report leaks/spills immediately. 4. Assess PPE selection, hazard identification, emergency sequence and safe behaviour.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of safety, ppe, first aid & fire?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a safety checklist for the fitting shop.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Raw material, tools and measuring instruments

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 03

Date: Week 03

Time: 1 Week

Lesson No:03

I. PREPARATION:

Title: Materials, tools and linear measurement + Bench vice and hacksawing fundamentals

1) Objectives: *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Steel rule, calipers, dividers, punches, hammer, sample MS bar. Bench vice, hacksaw frames, blades, MS sections, PPE.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Materials and basic measuring/marketing tools	1. Discuss selection of engineering material according to job requirement and visible condition. 2. Inspect stock for rust, scale, corrosion, cracks or other defects before use. 3. Explain steel rule use, divider setting, caliper use, odd-leg caliper use and basic punch identification. 4. Differentiate centre, dot and prick punches and relate each to marking-out work.	Teaching: Materials and basic measuring/marketing tools. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Bench vice, hacksaw and work holding	1. Identify bench-vice construction, fixed/movable jaw, spindle and common vice types. 2. Use soft vice clamps where required to protect finished surfaces. 3. Identify hacksaw frame and blade; select blade pitch/specification suitable for the section being cut. 4. Clamp the job securely with minimum projection and position the work for controlled sawing.	Teaching: Bench vice, hacksaw and work holding. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Marking and straight sawing practice	1. Mark a clear line using the appropriate tool and verify the line before cutting. 2. Start the hacksaw cut carefully and maintain the blade approximately in line with the marked path. 3. Use controlled strokes and avoid excessive force that may damage the blade or work. 4. Stop before the blade reaches the vice and finish the cut without striking the vice.	Teaching: Marking and straight sawing practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Wear eye protection and keep hands clear of the cutting path and blade teeth. 2. Do not use a cracked punch, damaged hammer, loose hacksaw blade or defective vice. 3. Check straightness, cut location, burrs and surface condition after sawing. 4. Assess tool identification, correct work holding, sawing technique and final workmanship.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of materials, tools and linear measurement + bench vice and hacksawing fundamentals?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Measure and record five sample dimensions. Practise straight saw cuts on marked MS sections.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Sawing different metal sections

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 04

Date: Week 04

Time: 1 Week

Lesson No:04

I. PREPARATION:

Title: Sawing different sections & marking practice

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Hacksaw, steel rule, dividers, odd-leg caliper, square, sections.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Sawing of different sections	1. Explain the difference in cutting approach for flats, angles and pipes. 2. Select suitable blade pitch and support the section so that vibration is minimized. 3. For hollow sections, avoid excessive blade pressure and maintain a stable cutting path. 4. Plan the cut to minimize waste and preserve the required finished dimension.	Teaching: Sawing of different sections. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Marking straight, parallel and curved lines	1. Use steel rule and appropriate marking tools to establish reference dimensions. 2. Use dividers for circles/arcs and odd-leg calipers for transferring or marking parallel lines. 3. Make lines thin, continuous and clearly visible without damaging the work surface. 4. Cross-check important dimensions before cutting.	Teaching: Marking straight, parallel and curved lines. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Practical operation and checking	1. Clamp each section securely in the bench vice before sawing. 2. Saw flats, angles and pipe sections to the marked line using controlled strokes. 3. Mark straight and parallel lines, then construct specified circles/arcs using dividers or calipers. 4. Verify location, parallelism and profile with the relevant measuring/inspection tool.	Teaching: Practical operation and checking. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use eye protection and keep the blade properly tensioned and seated in the frame. 2. Avoid twisting the blade, excessive force and unsupported pipe sections. 3. Deburr cut edges before handling or measurement. 4. Assess accuracy of marking, cut quality, tool selection and safe work holding.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of sawing different sections & marking practice?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Produce a marked-and-sawn sample with measured dimensions.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Filing: files, cuts and selection

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 05

Date: Week 05

Time: 1 Week

Lesson No:05

I. PREPARATION:

Title: Files and filing practice

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Flat, square, round and half-round files; file card; workpiece.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Files: construction, specification and uses	1. Explain file material, grade, cut, length and tooth form as file specifications. 2. Identify flat, hand, square, round, half-round, triangular and other common files by application. 3. Match coarse files to faster material removal and finer files to finishing work. 4. Explain file elements and the purpose of the handle/tang and cutting surfaces.	Teaching: Files: construction, specification and uses. Use demonstration, questioning and guided practice; verify the result before moving on.
2) File selection, care and maintenance	1. Select a file according to material, shape, access and required finish. 2. Use a sound handle and never operate a file with an exposed tang. 3. Clean teeth using the correct file-cleaning method and prevent contact with moisture or dirt. 4. Store files so that cutting edges are protected and files do not strike each other.	Teaching: File selection, care and maintenance. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Flat, square and channel filing	1. Secure the job at a convenient height and adopt balanced filing posture. 2. Apply controlled forward pressure and release pressure on the return stroke. 3. Use cross-filing for rapid removal and draw-filing where a smoother finish is required. 4. File flat, square and channel surfaces while checking dimensions and squareness regularly.	Teaching: Flat, square and channel filing. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Wear eye protection and keep the file handle firmly fitted. 2. Do not use a file as a lever, hammer or pry tool. 3. Check flatness, squareness, parallelism, surface finish and remaining allowance. 4. Assess correct file selection, posture, stroke, cleaning and finished accuracy.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of files and filing practice?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: File a flat surface to a specified rough-finish dimension.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Surface filing and parallel lines

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 06

Date: Week 06

Time: 1 Week

Lesson No:06

I. PREPARATION:

Title: Surface filing and checking

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Files, try square, steel rule, odd-leg caliper, vice.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Surface filing and accuracy	1. Explain the purpose of producing a flat reference surface before subsequent fitting operations. 2. Identify high spots and remove material progressively rather than over-filing. 3. Use the file face correctly and maintain a consistent filing direction. 4. Retain sufficient material until the reference dimensions are confirmed.	Teaching: Surface filing and accuracy. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Parallel and channel surfaces	1. Mark straight/parallel reference lines before filing where required. 2. Use suitable files for channel width and access; keep the file aligned with the required surface. 3. Check parallel surfaces against the drawing or specified dimensions. 4. Avoid rounding edges and maintain the required corner geometry.	Teaching: Parallel and channel surfaces. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Checking with steel rule and try square	1. Use the steel rule for linear dimension checks and the try square for 90° verification. 2. Place the try square consistently against the reference edge and observe light gap/fit. 3. Measure at more than one location to detect taper or non-parallel surfaces. 4. Correct high spots gradually and re-check after each controlled filing pass.	Teaching: Checking with steel rule and try square. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Keep the work securely held and the filing path clear of nearby persons. 2. Use a file handle and clean the file before storage. 3. Check flatness, parallelism, squareness and edge condition. 4. Assess filing technique, measurement practice and final dimensional control.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of surface filing and checking?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Complete a parallel filing exercise and record checks.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Marking with dividers and scribing block

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 07

Date: Week 07

Time: 1 Week

Lesson No:07

I. PREPARATION:

Title: Marking-out tools and methods + Chipping, chamfering and grooves

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Surface plate, scribing block, V-block, angle plate, marking blue, dividers. Ball-peen hammer, cold chisels, vice, PPE, MS sample.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Marking-out tools and reference surfaces	1. Identify scribing block, dividers, marking media, surface plate, V-block, angle plate and parallel block. 2. Explain why a clean, stable reference surface is necessary for accurate marking-out. 3. Use marking blue/Prussian blue/red lead/chalk as appropriate to improve line visibility. 4. Establish datums before transferring dimensions from the job drawing.	Teaching: Marking-out tools and reference surfaces. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Chisels and chipping fundamentals	1. Identify cold-chisel types and relate cutting angle/shape to the intended work. 2. Explain chisel material and the need for a sound, correctly ground cutting edge. 3. Hold the chisel securely and strike with a suitable hammer using controlled blows. 4. Plan chip direction and depth so that the work remains safe and controllable.	Teaching: Chisels and chipping fundamentals. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Chipping, chamfering and grooves	1. Practise chipping a flat surface in a controlled sequence, keeping the chisel aligned. 2. Produce a chamfer without removing excessive material from the reference edge. 3. Cut straight chip slots and oil grooves to the specified position and depth. 4. Check the profile and remove burrs after chipping.	Teaching: Chipping, chamfering and grooves. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Wear eye protection because chipping can produce flying metal fragments. 2. Do not use mushroomed chisel heads or damaged hammers. 3. Keep hands clear of the striking zone and secure the job firmly. 4. Assess marking accuracy, chisel control, groove/chamfer quality and safe practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of marking-out tools and methods + chipping, chamfering and grooves?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Mark a simple blueprint profile on a prepared surface. Perform a straight chipping and chamfering exercise.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Chisel sharpening and thin-sheet filing

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 08

Date: Week 08

Time: 1 Week

Lesson No:08

I. PREPARATION:

Title: Chisel sharpening and thin-metal filing

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Bench grinder, chisel, files, thin MS sheet, try square.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Chisel sharpening	1. Explain the purpose of maintaining the correct chisel cutting geometry for controlled chipping. 2. Identify the grinding wheel area used for offhand sharpening and the need for a sound wheel. 3. Maintain the cutting edge symmetrically and avoid overheating the tool. 4. Use cooling where required and inspect the edge before use.	Teaching: Chisel sharpening. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Thin-metal filing	1. Explain why thin sheet/strip requires controlled pressure and adequate support during filing. 2. Select a suitable fine file and prevent distortion by holding the work correctly. 3. File flat, square and parallel surfaces while retaining the required edge geometry. 4. Use repeated measurement to work toward the specified 0.5 mm accuracy.	Teaching: Thin-metal filing. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Guided and individual practice	1. Demonstrate offhand sharpening, then allow trainees to practise under close supervision. 2. File thin metal progressively and compare the surface against a straight reference. 3. Measure the result and correct high spots with light controlled strokes. 4. Repeat the operation independently after instructor feedback.	Teaching: Guided and individual practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use eye protection at the grinding station and keep hands clear of the wheel face. 2. Do not use excessive force or dwell at one point on the wheel. 3. Check chisel edge symmetry and job accuracy to the specified tolerance. 4. Assess sharpening technique, filing control, measurement and housekeeping.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of chisel sharpening and thin-metal filing?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Sharpen one chisel under supervision and file a thin-metal sample.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Sawing curves and thick sections

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 09

Date: Week 09

Time: 1 Week

Lesson No:09

I. PREPARATION:

Title: Advanced sawing and file steps + Combined file-and-saw practice

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Hacksaw, files, MS angle/pipe, step-fit sample, measuring tools. Hacksaw, files, square, calipers, deburring tools.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Advanced sawing and file steps	1. Plan straight and curved cuts according to the required finished profile and allowance. 2. Select blade pitch and cutting direction for thick mild-steel sections, angles and pipes. 3. Explain file steps as progressive removal stages before final finishing. 4. Retain a controlled allowance for smooth-file finishing to avoid oversize/undersize errors.	Teaching: Advanced sawing and file steps. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Combined file-and-saw job	1. Clamp the MS square or pipe securely and mark all critical dimensions before cutting. 2. Saw close to the marked line, leaving sufficient material for filing. 3. Use coarse/intermediate filing for stock removal and smooth filing for final finish. 4. Deburr edges before final measurement and inspection.	Teaching: Combined file-and-saw job. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Dimensional control and finish	1. Check critical dimensions at more than one location to detect taper or uneven filing. 2. Use steel rule, try square or other specified gauge according to the job requirement. 3. Aim for the specified ± 0.25 mm control where stated in the syllabus exercise. 4. Maintain clean reference faces and protect finished surfaces from damage.	Teaching: Dimensional control and finish. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use eye protection and correct hacksaw handling throughout the operation. 2. Keep the work firmly held and prevent blade twisting during curved cuts. 3. Inspect profile, dimensions, burrs and surface finish. 4. Assess the complete file-and-saw sequence and the trainee's ability to self-check.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of advanced sawing and file steps + combined file-and-saw practice?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Complete a stepped filing job and verify ± 0.25 mm accuracy. Produce a combined saw-and-file component from a drawing.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Radius filing and sheet-metal shearing

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 10

Date: Week 10

Time: 1 Week

Lesson No:10

I. PREPARATION:

Title: Radius filing and sheet-metal cutting

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Round/half-round files, gauges, snips, sheet metal, layout tools.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Radius filing	1. Distinguish convex and concave radius surfaces and understand the required matching relationship. 2. Mark the radius/profile clearly before material removal. 3. Select a suitable file shape for internal or external curvature. 4. Use progressive strokes to avoid flats and maintain the intended radius.	Teaching: Radius filing. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Sheet-metal cutting and edge treatment	1. Explain safe shearing/chipping of sheet metal and selection of suitable snips/tools. 2. Support the sheet so that the cut remains controlled and distortion is minimized. 3. Use step-and-file operations to remove irregularities and prepare edges. 4. Keep the finished edge free from sharp burrs.	Teaching: Sheet-metal cutting and edge treatment. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Matching and finishing practice	1. Produce convex and concave profiles according to the exercise dimensions. 2. Compare the two mating surfaces and identify high spots before further filing. 3. Finish the profile with controlled strokes and verify the shape by visual/gauge checking. 4. Cut and finish a sheet-metal edge using the specified sequence.	Teaching: Matching and finishing practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Wear eye protection and suitable hand protection when handling sheet edges. 2. Keep fingers away from snip blades and newly cut sheet edges. 3. Check radius continuity, fit/matching, edge condition and dimensional accuracy. 4. Assess tool selection, profile control, finishing and safe handling.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of radius filing and sheet-metal cutting?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a simple radius sample and a straight snip cut.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Drilling machines and drill selection

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 11

Date: Week 11

Time: 1 Week

Lesson No:11

I. PREPARATION:

Title: Drilling fundamentals and punch work

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Drill machine, twist drills, vice, centre punch, letter/number punches.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Drilling machines and drill construction	1. Identify bench, pillar and radial drilling machines and their principal uses. 2. Explain drill types, drill-point geometry, body, shank, flutes, margins and cutting lips at the level required for first-year practice. 3. Differentiate drill holding devices and select the correct arrangement for the job. 4. Explain why centre-punching/mark-off accuracy affects hole location.	Teaching: Drilling machines and drill construction. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Setup, work holding and hole marking	1. Select a sound drill and check that the chuck, spindle and work holding are secure. 2. Mark the hole centre accurately and support the work so it cannot rotate or lift. 3. Set the job square to the drill axis and choose a suitable speed/feed according to machine guidance. 4. Demonstrate through-hole drilling and safe chip control.	Teaching: Setup, work holding and hole marking. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Drilling and punch work practice	1. Clamp the work securely, align the marked centre and start the drill carefully. 2. Use controlled feed and withdraw as necessary to clear chips and prevent overheating. 3. Produce through holes to the specified position and check location/size after drilling. 4. Practise letter/number punches on suitable material using correct spacing and striking control.	Teaching: Drilling and punch work practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Wear eye protection and keep loose clothing, hair and hands away from rotating parts. 2. Never hold a rotating job by hand and never remove chips with bare fingers. 3. Stop the machine before measuring, adjusting or clearing chips. 4. Assess machine identification, setup, drilling technique, hole accuracy and punch-work safety.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of drilling fundamentals and punch work?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Drill a marked through-hole and punch a sample identification.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Tap drill size and drilling parameters

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 12

Date: Week 12

Time: 1 Week

Lesson No:12

I. PREPARATION:

Title: Drilling and tapping on MS flat

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Pillar/bench drill, twist drills, tap set, tap wrench, cutting fluid.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Tap-drill size and thread preparation	1. Explain the relationship between nominal thread size, pitch and tap-drill size as used for the specified exercise. 2. Use the prescribed tap-drill-size method/table rather than guessing the drill size. 3. Select the correct drill and produce the hole to the required size and depth. 4. Deburr/countersink the hole entrance lightly where required to start the tap correctly.	Teaching: Tap-drill size and thread preparation. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tapping sequence and tools	1. Identify taper/second/plug tap functions as applicable to the exercise and select the correct tap wrench. 2. Align the tap square with the work before applying controlled turning force. 3. Advance and periodically reverse as taught to break chips and prevent tap binding. 4. Differentiate through-hole and blind-hole tapping and observe the depth limitation in blind holes.	Teaching: Tapping sequence and tools. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Practical tapping on MS flat	1. Mark and drill the required hole locations in the mild-steel flat. 2. Start the tap squarely and cut the thread progressively through the required depth. 3. Withdraw and clean the tap safely, then check the thread with the specified mating component/gauge. 4. Correct minor starting errors only under instructor guidance; do not force a misaligned tap.	Teaching: Practical tapping on MS flat. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use eye protection and keep the job firmly held during drilling and tapping. 2. Avoid excessive torque that may break the tap; use suitable lubricant/cutting practice where specified. 3. Remove chips safely and clean the work before checking the thread. 4. Assess hole size, thread quality, alignment, depth and safe tool handling.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of drilling and tapping on ms flat?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a tapped hole in MS flat and inspect thread quality.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Sheet-metal workshop and materials

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 13

Date: Week 13

Time: 1 Week

Lesson No:13

I. PREPARATION:

Title: Sheet-metal tools, gauges and layout + Sheet-metal marking and development

1) **Objectives:** *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Snips, gauge, wing compass, trammel, stakes, sample sheets. Snips, steel rule, square, compass, sheet, scriber.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Sheet sizes and commercial sizes; coated sheets; shearing machine; wing compass, tinman's square, snips, hammers/mallets, trammel, sheet and wire gauge. Straight lines, circles, profiles and geometric shapes. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: cutting with snips; simple development; flaps for soldering/sweating.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of sheet-metal tools, gauges and layout + sheet-metal marking and development?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Lay out a simple sheet-metal development. Cut a simple developed pattern and label joint allowances.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Wiring, hemming and locked joints

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 14

Date: Week 14

Time: 1 Week

Lesson No: 14

I. PREPARATION:

Title: Sheet-metal joints: wiring and hemming

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Stakes, mallets, hammers, grooving tools, sheet, wire.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Wiring; single/double hemming; straight/curved edges. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: grooved and knocked-up joints; joint selection and tolerance.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of sheet-metal joints: wiring and hemming?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a short wired edge and a straight hem.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Soldering and brazing

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 15

Date: Week 15

Time: 1 Week

Lesson No:15

I. PREPARATION:

Title: Soldering and brazing fundamentals

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Soldering iron/heating source, solder, flux, PPE, sample joints.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Soldering materials and flux	1. Differentiate solder types and explain the function of flux in cleaning/protecting the joint area. 2. Relate solder composition and melting behaviour to soft soldering and silver soldering applications. 3. Select heating media and joint preparation appropriate to the work. 4. Stress clean, close-fitting joint surfaces for reliable solder flow.	Teaching: Soldering materials and flux. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Joint preparation and heating	1. Clean and fit the parts before heating; remove oil, oxide and dirt from the joint area. 2. Apply flux in the appropriate quantity and heat the work so that the solder melts from the joint temperature rather than direct flame contact. 3. Control heat to avoid burning flux, overheating the material or damaging adjacent parts. 4. For brazing/hard soldering, follow the specified torch and filler practice and maintain correct joint clearance.	Teaching: Joint preparation and heating. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Soft soldering and brazing practice	1. Demonstrate tinning/wetting and controlled filler addition for soft soldering. 2. Demonstrate the brazing sequence for a prepared joint using the specified filler and heating method. 3. Allow the filler to flow through the joint and avoid creating an external blob without proper wetting. 4. Cool, clean and inspect the joint after completion.	Teaching: Soft soldering and brazing practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use eye/hand protection and adequate ventilation; treat heated parts as hot until cooled. 2. Keep combustible materials away from the heating zone and handle flux/chemicals as instructed. 3. Check joint continuity, wetting, cleanliness and absence of visible defects. 4. Assess joint preparation, heating control, filler use, finish and safety behaviour.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of soldering and brazing fundamentals?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Complete one supervised soft-soldered joint.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Square container and tray construction

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 16

Date: Week 16

Time: 1 Week

Lesson No:16

I. PREPARATION:

Title: Sheet-metal container and tray

1) Objectives: *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Sheet, stakes, mallets, soldering tools, tinman's tools.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Bending curvature; wired edges; folding at angles using stakes. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: square container with handle; square tray with soldered corner.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of sheet-metal container and tray?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make/continue a simple square container or tray as per drawing.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Riveting tools and joints

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 17

Date: Week 17

Time: 1 Week

Lesson No:17

I. PREPARATION:

Title: Riveting and funnel construction + Arc welding safety and straight bead

1) Objectives: *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Rivets, rivet set/dolly, drill, sheet, funnel pattern. Arc welding set, electrode holder, electrodes, helmet, gloves, apron.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Rivet forms/heads; tinman's rivets; selection and spacing; dolly/snaps; hot vs cold riveting; riveted lap/butt joints. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: funnel development. Welding shop safety; electrical/gas precautions; PPE; transformer/generator; striking and maintaining arc; straight-line bead.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of riveting and funnel construction + arc welding safety and straight bead?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a short riveted lap or butt joint. Lay straight beads on plate under instructor supervision.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Arc butt and fillet welds

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 18

Date: Week 18

Time: 1 Week

Lesson No:18

I. PREPARATION:

Title: Arc butt and fillet welding

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Welding machine, electrodes, plates, chipping hammer, wire brush, PPE.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Arc butt and fillet joints	1. Explain butt and fillet joint configurations and their common workshop applications. 2. Select electrode type/size and machine settings according to the material, position and exercise requirement. 3. Explain arc length, travel angle, travel speed and bead overlap as quality factors. 4. Relate joint preparation and fit-up to weld penetration and final appearance.	Teaching: Arc butt and fillet joints. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Machine setup and work preparation	1. Inspect welding machine, leads, electrode holder, earth connection and work clamp before use. 2. Prepare and align the workpieces with the specified joint gap/fit-up. 3. Set current/polarity or other machine controls only as instructed for the selected electrode. 4. Position the job securely to maintain a stable welding posture.	Teaching: Machine setup and work preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Welding practice and bead control	1. Strike and maintain the arc, then control travel speed to form a consistent bead. 2. For butt joints, maintain alignment and avoid excessive heat input that can distort the work. 3. For fillet joints, maintain a stable electrode angle and consistent leg size. 4. Clean slag between passes and visually inspect the bead before accepting the job.	Teaching: Welding practice and bead control. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use welding helmet/hand shield, gloves, protective clothing and suitable footwear. 2. Provide adequate ventilation and keep flammable materials away from the arc area. 3. Inspect leads, holder and earth connection before energizing the machine. 4. Assess bead continuity, profile, fusion appearance, cleaning and safe welding practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of arc butt and fillet welding?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Perform a supervised butt or fillet weld and inspect visually.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Gas welding equipment and flame

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 19

Date: Week 19

Time: 1 Week

Lesson No:19

I. PREPARATION:

Title: Oxy-acetylene welding: setup and flame

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Oxy-acetylene set, regulators, torch, filler rod, goggles, gloves.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Oxy-acetylene equipment and gases	1. Identify high-pressure/low-pressure gas arrangements, cylinders, regulators, hoses and torch parts. 2. Explain the purpose of oxygen and acetylene and the function of each regulator/valve. 3. Inspect hoses, connections and fittings for damage before use and follow the shop procedure for cylinder handling. 4. Explain neutral, oxidizing and carburizing flame characteristics at the level required for the exercise.	Teaching: Oxy-acetylene equipment and gases. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Torch setup and flame adjustment	1. Connect the approved equipment only under instructor supervision and check for leaks using the prescribed safe method. 2. Set working pressures according to the approved shop procedure and equipment instructions. 3. Light and adjust the torch to the required flame condition without unsafe ignition practices. 4. Maintain correct torch position and distance from the work.	Teaching: Torch setup and flame adjustment. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Fusion run with and without filler	1. Clean and fit the workpieces before heating. 2. Demonstrate a fusion run without filler, maintaining a controlled molten pool and travel speed. 3. Repeat with filler rod, adding filler consistently without disturbing the pool excessively. 4. Inspect the bead for continuity, penetration appearance and surface defects.	Teaching: Fusion run with and without filler. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Keep cylinders upright/secured and away from heat and impact. 2. Use correct PPE and ventilation; prevent oil/grease contamination of oxygen equipment. 3. Close valves and follow shutdown/housekeeping procedure after the exercise. 4. Assess equipment identification, flame setting, torch control, bead quality and safe handling.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of oxy-acetylene welding: setup and flame?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Demonstrate safe setup checks and make a supervised fusion run.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Gas butt joint and cutting

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 20

Date: Week 20

Time: 1 Week

Lesson No:20

I. PREPARATION:

Title: Gas butt joint and MS gas cutting

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Oxy-acetylene set, cutting torch, MS plate, PPE, spark/fire controls.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Gas butt joint and cutting equipment	1. Explain the sequence for preparing and welding a gas butt joint in mild steel. 2. Identify oxy-acetylene cutting machine/torch parts and distinguish cutting oxygen from preheating functions. 3. Explain how correct preheat and cutting-oxygen action produces a cut through MS plate. 4. Relate nozzle selection, gas setting and travel speed to cut quality.	Teaching: Gas butt joint and cutting equipment. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Joint/cut preparation	1. Clean, align and tack/hold the butt joint as specified before heating. 2. For cutting, mark the cut line and support the plate securely with adequate clearance below the cut. 3. Inspect torch tip/nozzle and hose connections before operation. 4. Set the flame and cutting controls only after the equipment is checked.	Teaching: Joint/cut preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Practical gas welding and cutting	1. Produce the gas butt joint with controlled torch movement and filler addition where specified. 2. Start the cut with correct preheating, introduce cutting oxygen at the correct point and maintain steady travel. 3. Observe the cut front and adjust travel to maintain a continuous cut. 4. Clean slag and inspect the joint/cut edge after cooling.	Teaching: Practical gas welding and cutting. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use approved PPE, ventilation and fire precautions for gas work. 2. Never direct the torch toward cylinders, hoses or persons and never use leaking equipment. 3. Keep combustible material clear and follow the workshop gas-cylinder procedure. 4. Assess joint appearance, cut edge quality, equipment handling and emergency awareness.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of gas butt joint and ms gas cutting?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a short supervised cut and inspect edge quality.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Precision drilling and angular measurement

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 21

Date: Week 21

Time: 1 Week

Lesson No:21

I. PREPARATION:

Title: Vernier, micrometer and angular instruments

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Vernier caliper, micrometer, bevel protractor, height gauge, standards.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Vernier, micrometer and angular instruments	1. Explain the purpose and main parts of the vernier caliper, bevel protractor, micrometer and height gauge. 2. Identify main scale, vernier scale, spindle/anvil or angular scales as applicable. 3. Explain least count/graduation and the correct direction of reading without parallax or zero-error assumptions beyond the syllabus level. 4. Distinguish outside, inside, depth and digital micrometer applications.	Teaching: Vernier, micrometer and angular instruments. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Setting and measurement technique	1. Clean the measuring faces and the job before measurement. 2. Hold the instrument square to the feature and apply the correct measuring force. 3. For height-gauge work, use a stable surface plate and suitable scriber arrangement. 4. Record readings systematically and repeat critical measurements to confirm consistency.	Teaching: Setting and measurement technique. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Reading and practice	1. Demonstrate reading of vernier and micrometer scales using representative workshop dimensions. 2. Measure external, internal and depth features with the appropriate instrument. 3. Use the bevel protractor for angular measurement and compare the result with the specified angle. 4. Practise care, zero checking and proper storage after measurement.	Teaching: Reading and practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Do not force precision instruments or use them as clamps/scribing tools unless designed for that purpose. 2. Keep measuring faces clean and protect instruments from shock and contamination. 3. Check zero/condition before use and report suspected calibration problems. 4. Assess reading accuracy, instrument selection, measurement technique and record keeping.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of vernier, micrometer and angular instruments?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Take repeated measurements of a standard job and record readings.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Reaming, countersinking and counterboring

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 22

Date: Week 22

Time: 1 Week

Lesson No:22

I. PREPARATION:

Title: Reaming and three-piece split fit

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Drill machine, reamers, countersink/counterbore tools, gauges.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Countersink, counterbore, spot-facing; hand/machine reamers; determining hole size. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: reaming procedure; split-fit exercise.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of reaming and three-piece split fit?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Ream a prepared hole and check size/finish.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Internal threads: taps and tap wrench

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 23

Date: Week 23

Time: 1 Week

Lesson No:23

I. PREPARATION:

Title: Tapping through and blind holes + Dieing, studs, bolts and nuts

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Tap sets, tap wrench, pitch gauge, cutting fluid, workpiece. Dies, die stock, tap wrench, pitch gauge, lathe/fitting stock.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Thread terminology and tap standards	1. Define major/minor diameter, pitch, crest, root and flank in relation to screw threads. 2. Identify BSW, BSF, BA, BSP and metric/BIS coarse/fine thread families listed in the syllabus. 3. Match the tap type/size to the required internal thread and job specification. 4. Explain tap parts and the function of the tap wrench.	Teaching: Thread terminology and tap standards. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tapping and dieing tools	1. Identify taps, tap wrench, dies and die stock and explain their individual functions. 2. Select the correct die/thread standard and prepare the workpiece with the required chamfer. 3. Keep the die square to the work and use controlled forward/reverse motion to form the thread. 4. For broken-tap prevention, avoid excessive torque and maintain correct alignment and cutting practice.	Teaching: Tapping and dieing tools. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Stud, bolt and nut fitting practice	1. Prepare the stud/bolt/nut blanks to the specified dimensions. 2. Cut the external thread with the die and verify the thread using the mating component or appropriate gauge. 3. Prepare the nut hole and internal thread with the correct tap sequence. 4. Assemble and match the threaded components smoothly without forcing.	Teaching: Stud, bolt and nut fitting practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Secure the work firmly and keep hands clear of sharp threaded edges. 2. Use correct lubricant/cutting practice where specified and clean chips safely. 3. Check thread form, pitch/fit, alignment and component dimensions. 4. Assess tool selection, threading sequence, matching quality and safe practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of tapping through and blind holes + dieing, studs, bolts and nuts?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Tap a standard hole and verify thread with a mating component/gauge. Make an external threaded sample and match with a nut.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Step, angular and open fits

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 24

Date: Week 24

Time: 1 Week

Lesson No:24

I. PREPARATION:

Title: Fitting: step, angular and open/sliding fits

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Files, bevel gauge, calipers, surface plate, blue, fitting job.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Step fit; angular fit with bevel gauge (1° accuracy); simple open and sliding fits. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: enlargement of hole; cylindrical filing. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of fitting: step, angular and open/sliding fits?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Complete a simple step or open fit and test movement.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Curved profile and square fitting

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 25

Date: Week 25

Time: 1 Week

Lesson No:25

I. PREPARATION:

Title: Curved profile, square fit and grinding

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Files, gauges, bench grinder, dressing tool, fitting sample.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Open curved profile fit; inside square fit; drill-location correction. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: grinding wheel abrasive/grade/structure/bond; mounting and dressing.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of curved profile, square fit and grinding?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Complete a supervised profile or square fit and inspect clearance.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Interchangeability, limits and tolerances

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 26

Date: Week 26

Time: 1 Week

Lesson No:26

I. PREPARATION:

Title: Sliding T-fit and limits/fits

1) Objectives: *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Vernier, micrometer, height gauge, blue, T-fit components.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Sliding T-fit; interchangeability; basic/actual size; deviation. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: high/low limits; zero line; tolerance zone; British/BIS systems.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of sliding t-fit and limits/fits?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Measure mating parts and document limits and fit condition.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Angular/profile fits and materials

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 27

Date: Week 27

Time: 1 Week

Lesson No:27

I. PREPARATION:

Title: Combined/angular/profile fits

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Height gauge, bevel protractor, files, gauges, steel/aluminium/brass samples.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Combined/open/profile fit; internal angles to 30 minutes. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: sliding fit at angles other than 90°; ferrous/non-ferrous material properties.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of combined/angular/profile fits?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a controlled angular/profile fit and record inspection results.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Scraping and blue matching

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 28

Date: Week 28

Time: 1 Week

Lesson No:28

I. PREPARATION:

Title: Scraping and bearing-surface testing + Precision fits and measurement control

1) **Objectives:** *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Scrapers, blue, surface plate/master reference, fitting job, PPE. Micrometer, DTI, height gauge, drill, fasteners, fitting components.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Flat/half-round/triangular/hook scrapers; scraping flat/curved surfaces; blue matching; Whitworth method; test without master plate. Combined radius/angular fit. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: accurate holes for studs; fasteners; Vernier micrometer and screw-thread micrometer; DTI and comparator concepts.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of scraping and bearing-surface testing + precision fits and measurement control?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Perform a small supervised scraping/blue-match exercise. Inspect a fitting assembly and record dimensional deviations.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Final sliding-fit assembly

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 29

Date: Week 29

Time: 1 Week

Lesson No:29

I. PREPARATION:

Title: High-accuracy sliding fit assembly

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Files, micrometer, vernier, height gauge, DTI, blue, assembly hardware.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Concepts, terminology and job requirement	1. Teach the listed syllabus elements: Sliding fit with parallel/angular mating surfaces; target tolerance ± 0.04 mm and angular tolerance 30 min. 2. Explain the purpose, terminology and sequence of the operation before practical work. 3. Relate each element to the job drawing/specification and the expected finished result. 4. Use questioning to check prerequisite knowledge and correct misconceptions before demonstration.	Teaching: Concepts, terminology and job requirement. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tools, equipment and preparation	1. Identify and explain selection/use of: final assembly and functional check.. 2. Check condition, specification and suitability of tools/equipment before starting. 3. Prepare the workpiece, reference surfaces, materials and measuring instruments required for the exercise. 4. Demonstrate correct work holding, setup and tool positioning before the trainee starts.	Teaching: Tools, equipment and preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Procedure, practice and verification	1. Demonstrate the operation step-by-step, emphasizing the sequence stated in the syllabus exercise. 2. Allow guided practice first; correct technique, alignment, feed/pressure or calculation method as required. 3. Move to individual practice and require trainees to verify dimensions, profile, calculation or drawing result. 4. Record the completed work and compare it with the stated specification/learning outcome.	Teaching: Procedure, practice and verification. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use the PPE and safe operating practices appropriate to the tools/machines involved. 2. Prevent unsafe acts such as poor work holding, incorrect tool selection, excessive force or unauthorized machine operation. 3. Check dimensions, surface finish, drawing accuracy, functional fit or numerical result before acceptance. 4. Assess through observation, oral/written questions, practical performance and the trainee record.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of high-accuracy sliding fit assembly?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Complete and submit the fit job with inspection record.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Lathe: safety, construction and chucking

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 30

Date: Week 30

Time: 1 Week

Lesson No:30

I. PREPARATION:

Title: Lathe introduction and four-jaw work

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Centre lathe, four-jaw chuck, knife/facing tool, centres, calipers.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Lathe construction, specification and safety	1. Identify the centre lathe and explain its principal specifications at the first-year level. 2. Identify bed, headstock, spindle, carriage, cross-slide, compound slide, tool post and tailstock. 3. Explain basic feed and thread mechanisms and the purpose of the lead screw/feed rod. 4. Review lathe guarding, chuck safety and emergency stop requirements before operation.	Teaching: Lathe construction, specification and safety. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Four-jaw chuck and work setting	1. Explain independent four-jaw chuck operation and how it differs from self-centering chucks. 2. Mount the work securely and use suitable protection for finished surfaces where required. 3. Use a dial indicator/approved method to true the job in the chuck. 4. Check chuck key removal and ensure the work has adequate clearance before starting the spindle.	Teaching: Four-jaw chuck and work setting. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Facing and between-centres work	1. Demonstrate tool setting at the correct centre height and establish a safe starting position. 2. Face the work to produce a true reference end while controlling feed and tool engagement. 3. Set and support the job between centres where required and check alignment. 4. Measure the result and correct the setup before continuing to subsequent operations.	Teaching: Facing and between-centres work. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Never leave the chuck key in the chuck and keep hands, clothing and tools away from rotating work. 2. Stop the spindle before measuring, adjusting or removing chips. 3. Check facing flatness, centre alignment, surface finish and workholding security. 4. Assess machine identification, setup, facing technique, measurement and safe operation.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of lathe introduction and four-jaw work?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: True a simple job and face both ends under supervision.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Three-jaw chuck and plain turning

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 31

Date: Week 31

Time: 1 Week

Lesson No:31

I. PREPARATION:

Title: Three-jaw chuck, facing and parallel turning

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Lathe, three-jaw chuck, roughing tool, calipers, steel rule.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Three-jaw chuck and tool selection	1. Explain the self-centering action and common use of the three-jaw chuck. 2. Select a suitable roughing/turning tool and explain the purpose of tool geometry at the first-year level. 3. Mount the job with adequate gripping length and check that the work is secure. 4. Set the tool correctly relative to the work centre.	Teaching: Three-jaw chuck and tool selection. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Facing and plain turning setup	1. Face the job to establish a reference surface before measuring length. 2. Set spindle speed/feed according to the material, tool and shop guidance. 3. Take controlled cuts and maintain a consistent feed for parallel turning. 4. Use an outside caliper/steel rule for the specified diameter check where required.	Teaching: Facing and plain turning setup. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Parallel turning practice	1. Turn the cylindrical surface progressively toward the specified diameter. 2. Measure at more than one location to detect taper and correct the operation if needed. 3. Maintain a clean reference surface and avoid damaging the finished diameter during measurement. 4. Target the stated ± 0.1 mm accuracy for the exercise.	Teaching: Parallel turning practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Remove chuck key immediately after use and never measure a rotating workpiece. 2. Keep the cutting tool and tool post secure; clear chips only after stopping the machine. 3. Check diameter, parallelism, surface finish and end-face condition. 4. Assess workholding, tool setting, turning technique and dimensional accuracy.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of three-jaw chuck, facing and parallel turning?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Turn a simple diameter to ± 0.1 mm and verify.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Step turning, parting and chamfering

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 32

Date: Week 32

Time: 1 Week

Lesson No:32

I. PREPARATION:

Title: Step turning, parting, chamfering and shoulders

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Lathe, turning/parting/form tools, vernier/caliper, deburring tools.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Step turning and shoulders	1. Explain the purpose of step turning and the need for accurate shoulder locations. 2. Plan facing, rough turning and finishing cuts from the drawing dimensions. 3. Form square, filleted or bevelled shoulders according to the job requirement. 4. Use suitable tool geometry for chamfering, rounded ends and undercuts/form features.	Teaching: Step turning and shoulders. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Parting, chamfering and tool setup	1. Identify parting tool and explain the need for correct centre height and alignment. 2. Set the parting tool square to the work and provide adequate support/clearance. 3. Produce chamfers and remove sharp edges without altering critical dimensions. 4. Use form tools only for the specified profile and avoid excessive cutting force.	Teaching: Parting, chamfering and tool setup. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Practical step-turning sequence	1. Face the job, establish reference dimensions and rough-turn the required steps. 2. Finish each diameter and shoulder in a controlled sequence, measuring between operations. 3. Part off only after checking the remaining support and workholding condition. 4. Deburr and inspect the finished profile against the job drawing.	Teaching: Practical step-turning sequence. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Keep hands and loose clothing away from rotating work and tool overhangs. 2. Stop the spindle before changing tools or measuring. 3. Check step lengths, diameters, shoulder squareness, chamfers and undercuts. 4. Assess sequence planning, tool setting, dimensional control and safe lathe practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of step turning, parting, chamfering and shoulders?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Produce a stepped job with a chamfered end.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Grooving, knurling and boring

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 33

Date: Week 33

Time: 1 Week

Lesson No:33

I. PREPARATION:

Title: Grooving, knurling and boring

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Lathe, grooving/knurling/boring tools, coolant, drill, measuring tools.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Grooving and knurling	1. Identify square, round and V-groove tools and explain their intended applications. 2. Identify knurling tool, grade/pitch considerations and the need for suitable speed/feed and coolant as specified. 3. Explain boring as internal turning and distinguish pilot drilling, hole enlargement and spot-facing. 4. Relate boring-bar rigidity and alignment to hole accuracy and finish.	Teaching: Grooving and knurling. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tool setup and work preparation	1. Set groove tools square/centered as appropriate and ensure adequate clearance. 2. Set knurling tool correctly against the work and verify machine settings before engagement. 3. Prepare a pilot hole before boring and secure the work adequately. 4. Check the boring tool overhang and alignment to reduce chatter.	Teaching: Tool setup and work preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Practical operations	1. Produce specified grooves with controlled depth and width. 2. Perform knurling with steady engagement and appropriate feed/coolant practice. 3. Pilot-drill, bore/enlarge the hole and spot-face where required by the exercise. 4. Measure groove dimensions and hole size after stopping the machine.	Teaching: Practical operations. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Keep hands clear of knurling rollers, rotating work and chip zones. 2. Stop the machine before measuring or clearing chips. 3. Inspect groove profile, knurl pattern, hole size, concentricity and surface condition. 4. Assess tool selection, setup, operation sequence and safe working practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of grooving, knurling and boring?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Make a grooved/knurled feature and bore a prepared hole.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Taper turning

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 34

Date: Week 34

Time: 1 Week

Lesson No:34

I. PREPARATION:

Title: Taper turning and taper pins

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Lathe, taper setup, taper gauge, calipers/micrometer, cutting tools.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Taper fundamentals	1. Define taper and explain how it is expressed on engineering components. 2. Differentiate internal and external taper and identify standard taper applications listed in the syllabus. 3. Introduce Morse taper and taper-pin use as workshop examples. 4. Relate taper angle/ratio to the required job dimensions.	Teaching: Taper fundamentals. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Taper calculation and setup	1. Read the given taper dimensions from the job drawing. 2. Calculate the required taper relationship using the method taught for the exercise. 3. Select the appropriate lathe taper-turning method/tool arrangement under instructor guidance. 4. Check tool/work alignment before taking the finishing cut.	Teaching: Taper calculation and setup. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Taper turning and taper pins	1. Produce the external/internal taper progressively, leaving allowance for final measurement. 2. Measure large and small diameters/length as applicable to the drawing. 3. Prepare taper pins to the specified form and check matching/gauge fit where required. 4. Finish and deburr the taper without damaging the reference surfaces.	Teaching: Taper turning and taper pins. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use correct workholding and keep the tailstock/attachments secure. 2. Stop the spindle before changing the taper setup or measuring. 3. Check taper dimensions, angle/ratio, surface finish and fit. 4. Assess calculation, machine setup, turning sequence and final matching.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of taper turning and taper pins?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Turn a simple taper/pin and check with the specified gauge.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Lathe threading

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 35

Date: Week 35

Time: 1 Week

Lesson No:35

I. PREPARATION:

Title: External V-thread on lathe

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Lathe, threading tool, centre gauge, pitch gauge, dies/taps, nut blank.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) External V-thread concepts	1. Explain thread pitch, crest, root, flank and included angle for the external V-thread exercise. 2. Use a screw-pitch gauge to identify/verify the required pitch. 3. Explain the purpose of a centre gauge in setting the threading tool. 4. Relate thread depth and tool setting to the final nut fit.	Teaching: External V-thread concepts. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Tool setting and work preparation	1. Prepare the workpiece to the major diameter and provide the required chamfer/run-out. 2. Set the threading tool square using the centre gauge and establish the correct starting position. 3. Select the lathe threading gear/feed arrangement according to the required pitch and machine instructions. 4. Prepare the mating nut/part as specified for matching.	Teaching: Tool setting and work preparation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Thread cutting and matching	1. Start the thread at a controlled depth and increase cutting depth progressively. 2. Maintain correct tool position and feed engagement for each pass. 3. Use the pitch gauge and visual inspection to confirm thread form. 4. Match the finished external thread with the prepared nut without forcing.	Teaching: Thread cutting and matching. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Stop the spindle before checking the thread or adjusting the tool. 2. Keep hands away from the rotating thread and cutting zone. 3. Check pitch, thread form, major diameter, finish and mating fit. 4. Assess tool setting, threading sequence, machine control and safe practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of external v-thread on lathe?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Produce an external V-thread and match a nut.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Machine repair and preventive maintenance

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 36

Date: Week 36

Time: 1 Week

Lesson No:36

I. PREPARATION:

Title: Machine repair, preventive maintenance & pneumatic assembly

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Drill/lathe/power saw/bench grinder manuals, checklist, lubrication tools. Pneumatic trainer, pressure gauge, torque wrench, dowel pins, bolts/screws.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Machine repair and preventive maintenance	1. Explain the purpose of planned maintenance and the difference between routine, autonomous and total-quality-oriented maintenance practices listed in the syllabus. 2. Use the approved maintenance checklist to identify lubrication, pressure, temperature, oil level and general-condition checks. 3. Read the blueprint/assembly information before dismantling or correcting an assembly fault. 4. Record abnormal conditions and report items requiring authorized repair.	Teaching: Machine repair and preventive maintenance. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Pneumatic assembly and jointing	1. Set the pneumatic supply to the specified pressure using the approved regulator and gauge. 2. Align components before fixing and use correct threaded jointing/sealing methods. 3. Tighten fasteners to the specified torque where applicable and use dowel pins for correct location. 4. Check hose/fitting condition and leak-tightness before functional testing.	Teaching: Pneumatic assembly and jointing. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Assembly, fault correction and testing	1. Assemble simple components from the drawing in the correct sequence. 2. Identify misalignment, loose joints, incorrect orientation or other assembly faults and rectify them safely. 3. Perform a functional check after assembly and confirm that moving parts operate correctly. 4. Complete the maintenance/inspection record with findings and corrective action.	Teaching: Assembly, fault correction and testing. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Isolate energy sources before maintenance or adjustment and release stored pneumatic pressure where required. 2. Use correct tools and avoid unauthorized modification of equipment. 3. Check alignment, sealing, fastening, lubrication and functional performance. 4. Assess checklist use, fault finding, assembly accuracy and safe maintenance practice.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of machine repair, preventive maintenance & pneumatic assembly?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: oral/written questions + observation of practical performance + dimensional/quality check + trainee record.

Assignment: Complete a machine inspection checklist under supervision. Perform pressure-setting and torque-controlled assembly checks.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Engineering drawing: instruments and conventions

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 37

Date: Week 37

Time: 1 Week

Lesson No:37

I. PREPARATION:

Title: Engineering Drawing: instruments and freehand basics

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Construct/read the specified engineering-drawing elements correctly.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Drawing board/sheet, instruments, pencils, ruler, set square, sample tools.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Drawing sheets, layout and instruments	1. Identify drawing-sheet sizes/layout, borders and the title-block area used for engineering drawings. 2. Identify common drawing instruments and explain their correct handling and care. 3. Introduce standard line types and their visual purpose in a technical drawing. 4. Explain why neatness, proportion and clear line work are essential for communication.	Teaching: Drawing sheets, layout and instruments. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Freehand geometric sketches	1. Practise freehand circles, straight lines, simple blocks and basic geometric forms. 2. Transfer measured proportions from a simple component to a freehand sketch without pretending the sketch is a scaled drawing. 3. Keep construction lines light and final visible lines clear. 4. Use the title block and simple notes as directed by the drawing exercise.	Teaching: Freehand geometric sketches. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Guided drawing practice	1. Demonstrate correct grip and use of drawing instruments before individual practice. 2. Construct the required lines and geometric figures in sequence. 3. Check spacing, line quality, proportion and completeness before finalizing. 4. Allow individual correction and re-drawing of inaccurate elements.	Teaching: Guided drawing practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Handle drawing instruments carefully and keep sharp points protected. 2. Maintain a clean drawing sheet and prevent erasing damage. 3. Check line type, geometry, layout and legibility against the exercise requirement. 4. Assess instrument handling, freehand control, neatness and completion.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of engineering drawing: instruments and freehand basics?
- 2) Which drawing convention/projection/dimensioning rule is applied?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: drawing exercise + convention/projection questions + checking of line quality, dimensioning and accuracy.

Assignment: Prepare a sheet with title block and freehand tool sketches.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Geometrical figures and lettering

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 38

Date: Week 38

Time: 1 Week

Lesson No:38

I. PREPARATION:

Title: Engineering Drawing: geometry and lettering

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Construct/read the specified engineering-drawing elements correctly.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Drawing instruments, compass, set squares, pencil, eraser.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Geometric constructions	1. Construct and identify angle, triangle, circle, rectangle, square and parallelogram forms as specified. 2. Explain the construction sequence rather than relying on freehand approximation for instrument work. 3. Use appropriate instrument edges and reference points for accurate construction. 4. Keep construction lines light and distinguish them from final outlines.	Teaching: Geometric constructions. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Single-stroke lettering and numbering	1. Introduce single-stroke lettering/numbering with consistent height, spacing and inclination as specified. 2. Practise uppercase letters and numerals using controlled stroke sequence. 3. Maintain uniform character size and avoid crowding or uneven spacing. 4. Use lettering suitable for titles, notes and dimension-related information.	Teaching: Single-stroke lettering and numbering. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Dimensioned freehand blocks	1. Sketch simple blocks freehand using proportion and transferred measurements. 2. Add the required dimensions with clear extension/dimension lines as instructed. 3. Check the sketch against the given dimensions before finalizing. 4. Correct uneven lettering, unclear geometry or missing dimensions.	Teaching: Dimensioned freehand blocks. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Keep instrument points and blades protected when not in use. 2. Maintain a clean, dry drawing surface and handle sheets carefully. 3. Check geometry, lettering height/spacing, dimensions and legibility. 4. Assess construction accuracy, lettering discipline and completeness.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of engineering drawing: geometry and lettering?
- 2) Which drawing convention/projection/dimensioning rule is applied?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: drawing exercise + convention/projection questions + checking of line quality, dimensioning and accuracy.

Assignment: Complete one sheet of figures and single-stroke lettering.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Dimensioning and symbols

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 39

Date: Week 39

Time: 1 Week

Lesson No:39

I. PREPARATION:

Title: Engineering Drawing: dimensioning and symbols

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Construct/read the specified engineering-drawing elements correctly.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Drawing sheet, scale, set squares, sample job drawing.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Dimensioning principles	1. Identify arrowheads, dimension lines, extension lines and leader lines and explain their purposes. 2. Differentiate unidirectional and aligned dimensioning methods. 3. Place dimensions so that the drawing remains readable and unambiguous. 4. Avoid duplicate, conflicting or poorly positioned dimensions.	Teaching: Dimensioning principles. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Leaders, notes and symbols	1. Use leader lines to connect notes/symbolic information to the relevant feature. 2. Introduce related-trade symbolic representation as required by the exercise. 3. Keep symbols and notes clear, correctly oriented and legible. 4. Relate each symbol to the feature or process it represents rather than memorizing isolated shapes.	Teaching: Leaders, notes and symbols. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Dimensioning practice	1. Apply arrowheads and dimensioning to simple blocks and component sketches. 2. Use aligned/unidirectional style consistently within a drawing. 3. Add leader notes and specified symbols without crossing important geometry unnecessarily. 4. Check that all required sizes/features are communicated.	Teaching: Dimensioning practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Handle instruments carefully and maintain clean sheets. 2. Check line hierarchy, dimension placement, arrowhead consistency and symbol accuracy. 3. Confirm that dimensions are readable and correspond to the geometry. 4. Assess practical drawing accuracy, conventions and interpretation.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of engineering drawing: dimensioning and symbols?
- 2) Which drawing convention/projection/dimensioning rule is applied?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: drawing exercise + convention/projection questions + checking of line quality, dimensioning and accuracy.

Assignment: Dimension a simple fitting job drawing using one consistent method.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Orthographic and isometric projection

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 40

Date: Week 40

Time: 1 Week

Lesson No:40

I. PREPARATION:

Title: Engineering Drawing: projection and job drawing

1) **Objectives:** *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Construct/read the specified engineering-drawing elements correctly.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Projection models, drawing instruments, sample job drawings.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Projection fundamentals	1. Explain axes, planes and quadrants used to establish projection concepts. 2. Differentiate orthographic and isometric representation at the first-year level. 3. Explain first-angle and third-angle projection concepts and their arrangement. 4. Relate the projection method to reading a job drawing correctly.	Teaching: Projection fundamentals. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Job drawing interpretation	1. Identify views, reference directions and projection symbols on a related-trade drawing. 2. Read dimensions and simple notes from the supplied job drawing. 3. Recognize how a three-dimensional object is represented by related views. 4. Use the drawing as the controlling reference for practical dimensions and features.	Teaching: Job drawing interpretation. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Projection and job-drawing practice	1. Construct simple orthographic/isometric representations as specified in the exercise. 2. Arrange views correctly according to the projection method being taught. 3. Transfer dimensions and important features accurately between views. 4. Compare the completed drawing with the original specification and correct errors.	Teaching: Projection and job-drawing practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Maintain drawing-sheet cleanliness and protect instrument points. 2. Check projection arrangement, view alignment, dimensions and line types. 3. Verify that the drawing can be interpreted without ambiguity. 4. Assess projection understanding, job-drawing reading and drawing accuracy.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of engineering drawing: projection and job drawing?
- 2) Which drawing convention/projection/dimensioning rule is applied?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: drawing exercise + convention/projection questions + checking of line quality, dimensioning and accuracy.

Assignment: Draw/read a simple orthographic and isometric representation.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: WCS: units and fractions

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 41

Date: Week 41

Time: 1 Week

Lesson No:41

I. PREPARATION:

Title: WCS: units, measurement and fractions

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Apply the specified workshop-calculation/science method correctly and show the working.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Calculator, conversion chart, measurement samples.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Units and measurement systems	1. Identify FPS, CGS, MKS and SI systems and distinguish fundamental from derived units. 2. Relate common workshop quantities to their correct units. 3. Explain the need for unit consistency before performing a calculation. 4. Use conversion factors carefully and record units with answers.	Teaching: Units and measurement systems. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Factors, HCF/LCM and fractions	1. Review factors, HCF and LCM as tools for simplifying workshop calculations. 2. Perform addition, subtraction, multiplication and division of common fractions. 3. Convert between fractions and decimal fractions where required. 4. Use a calculator correctly for the specified operations and check reasonableness.	Teaching: Factors, HCF/LCM and fractions. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Calculation practice	1. Solve representative unit-conversion and fraction problems step-by-step. 2. Write the given data, operation, calculation and final unit clearly. 3. Cross-check results using an alternative method or calculator when appropriate. 4. Relate numerical work to simple fitter measurement/job examples.	Teaching: Calculation practice. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use calculators responsibly and avoid copying intermediate values incorrectly. 2. Keep calculation units visible to prevent dimensional errors. 3. Check significant arithmetic steps before recording the final answer. 4. Assess method, unit conversion, fraction work, calculator use and accuracy.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of wcs: units, measurement and fractions?
- 2) Solve or describe one representative calculation from this topic.
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: numerical worksheet + oral questioning + verification of method and answer.

Assignment: Solve a worksheet of unit conversion and fraction problems.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: WCS: square root, ratio and percentage

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 42

Date: Week 42

Time: 1 Week

Lesson No:42

I. PREPARATION:

Title: WCS: square root, ratio, proportion and percentage

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Apply the specified workshop-calculation/science method correctly and show the working.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Calculator, worksheet, triangle sketches, sample dimensions.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Square, square root and Pythagoras	1. Explain square and square-root operations and their workshop relevance. 2. Use a calculator for square-root problems and verify the result. 3. Apply Pythagoras to right-angled triangle situations arising in fitting/layout work. 4. Identify the known and unknown sides before selecting the calculation.	Teaching: Square, square root and Pythagoras. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Ratio and proportion	1. Explain ratio as comparison of quantities and distinguish direct from indirect proportion. 2. Set up ratios in a consistent order and simplify where appropriate. 3. Use proportion to determine unknown dimensions/quantities from known relationships. 4. Check whether the result increases or decreases as expected.	Teaching: Ratio and proportion. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Percentage calculations	1. Convert fractions/decimals to percentages and vice versa. 2. Calculate percentage increase/decrease or percentage values in simple workshop contexts. 3. Show the calculation steps clearly before using the calculator to verify. 4. Interpret the answer in the original unit/context rather than leaving it as an unexplained number.	Teaching: Percentage calculations. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Check calculator entries and decimal placement carefully. 2. Keep units and given data visible during calculations. 3. Use estimation to detect obviously unreasonable answers. 4. Assess square-root, Pythagoras, ratio/proportion and percentage methods.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of wcs: square root, ratio, proportion and percentage?
- 2) Solve or describe one representative calculation from this topic.
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: numerical worksheet + oral questioning + verification of method and answer.

Assignment: Solve five trade-related numerical problems.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: WCS: mass, density, speed and energy

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 43

Date: Week 43

Time: 1 Week

Lesson No:43

I. PREPARATION:

Title: WCS: mass, density, speed, work and power

1) Objectives: (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Apply the specified workshop-calculation/science method correctly and show the working.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Calculator, formula sheet, sample masses/volumes.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Mass, weight, volume and density	1. Distinguish mass and weight and identify common units used in workshop calculations. 2. Calculate volume for simple regular shapes using the appropriate geometric relation. 3. Define density and specific gravity and relate them to material identification/calculation. 4. Use consistent units before substituting values into a formula.	Teaching: Mass, weight, volume and density. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Speed and velocity	1. Distinguish speed from velocity at the introductory level and identify distance/time relationships. 2. Calculate simple speed values and convert units when required. 3. Relate speed calculations to machine/workshop examples without confusing linear and rotational quantities. 4. Check whether the final unit is appropriate for the requested quantity.	Teaching: Speed and velocity. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Work, power, energy and horsepower	1. Explain work as force acting through distance and distinguish power as rate of doing work. 2. Introduce energy in the workshop context and relate it to machine operation. 3. Explain HP, IHP and BHP terms as listed in the syllabus and use the prescribed relationships. 4. Interpret efficiency as useful output compared with input.	Teaching: Work, power, energy and horsepower. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Use correct units and label every numerical answer. 2. Check whether the chosen formula matches the quantity asked for. 3. Use calculator verification and estimation to detect arithmetic mistakes. 4. Assess mass/density, speed, work/power, HP and efficiency calculations.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of wcs: mass, density, speed, work and power?
- 2) Solve or describe one representative calculation from this topic.
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: numerical worksheet + oral questioning + verification of method and answer.

Assignment: Solve a set of workshop calculation problems.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: WCS: heat, temperature and pressure

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 44

Date: Week 44

Time: 1 Week

Lesson No:44

I. PREPARATION:

Title: WCS: heat, temperature, pressure and electricity

1) Objectives: *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Apply the specified workshop-calculation/science method correctly and show the working.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) Teaching Aids: Thermometer illustration, pressure gauge, electrical trainer/chart, calculator.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Heat and temperature	1. Define heat and temperature and distinguish them conceptually. 2. Discuss effects of heat and the meaning of melting and boiling points. 3. Use Celsius, Fahrenheit and Kelvin scales and perform the conversions required by the syllabus. 4. Relate thermal expansion/temperature effects to practical workshop situations.	Teaching: Heat and temperature. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Pressure and its forms	1. Define pressure and identify common pressure units used in workshop practice. 2. Differentiate atmospheric, absolute and gauge pressure. 3. Explain the reference pressure used for each form and avoid mixing units in calculations. 4. Relate pressure readings to pneumatic/gas equipment safely.	Teaching: Pressure and its forms. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Basic electricity	1. Differentiate AC and DC and identify voltage and resistance as basic electrical quantities. 2. Explain voltage as electrical potential difference and resistance as opposition to current. 3. Use correct electrical units and symbols at the introductory level. 4. Relate electrical safety to workshop machines and portable equipment.	Teaching: Basic electricity. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Safety, quality and assessment	1. Never work on live electrical equipment unless specifically authorized and trained. 2. Treat gas/pressure systems as stored-energy hazards and follow isolation procedures. 3. Check temperature/pressure units and conversion steps carefully. 4. Assess temperature scales, pressure concepts, AC/DC distinction, voltage/resistance and safety.	Teaching: Safety, quality and assessment. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of wcs: heat, temperature, pressure and electricity?
- 2) Solve or describe one representative calculation from this topic.
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: numerical worksheet + oral questioning + verification of method and answer.

Assignment: Complete a short numerical and concept worksheet.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: WCS: mensuration

JTO/VI

TO/Section I/c

Fitter Head of Department:

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 45

Date: Week 45

Time: 1 Week

Lesson No:45

I. PREPARATION:

Title: WCS: mensuration, simple machines and trigonometry

1) **Objectives:** (At the end of the lesson the trainees will be able to)

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Apply the specified workshop-calculation/science method correctly and show the working.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** Calculator, shape models, protractor, trig table, worksheets.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Mensuration of common shapes	1. Calculate area and perimeter of common plane figures such as rectangles, squares, triangles and circles. 2. Select the correct dimension from the sketch before substituting into the relation. 3. Keep units consistent and state the final unit as linear or square measure as appropriate. 4. Relate area calculations to plate/sheet and layout examples.	Teaching: Mensuration of common shapes. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Surface area and volume	1. Calculate surface area/volume of common solids and simple vessels using the required dimensions. 2. Break complex shapes into simpler known solids where appropriate. 3. Check whether the result is area, volume or capacity and record the correct unit. 4. Use calculator verification for arithmetic-heavy problems.	Teaching: Surface area and volume. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Simple machines and efficiency	1. Identify basic lever/simple-machine concepts and the terms MA, VR and efficiency. 2. Relate effort, load and mechanical advantage to workshop lifting/handling examples. 3. Distinguish velocity ratio from mechanical advantage and use the prescribed relationships. 4. Interpret efficiency as the relationship between useful output and input.	Teaching: Simple machines and efficiency. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Angle measurement and trigonometry	1. Measure angles using the appropriate instrument and identify right-angled triangle relationships. 2. Use basic trigonometric ratios and tables as specified for first-year workshop calculations. 3. Identify opposite, adjacent and hypotenuse before selecting a ratio. 4. Check the calculated angle/length against the sketch for reasonableness.	Teaching: Angle measurement and trigonometry. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) What is the purpose and sequence of wcs: mensuration, simple machines and trigonometry?
- 2) Solve or describe one representative calculation from this topic.
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: numerical worksheet + oral questioning + verification of method and answer.

Assignment: Complete an integrated mensuration/trigonometry worksheet.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Integrated revision and assessment

JTO/VI

TO/Section I/c

LESSON PLAN

Trade: FITTER

Debargha Memorial ITI

Module/Unit: Week 46

Date: Week 46

Time: 1 Week

Lesson No:46

I. PREPARATION:

Title: Integrated revision, practical assessment and project planning

1) **Objectives:** *(At the end of the lesson the trainees will be able to)*

1. Explain the concepts, terminology and purpose of the weekly topic.
2. Demonstrate the specified procedure or calculation in the correct sequence.
3. Select and use tools/equipment correctly and apply the required safety precautions.
4. Check the result against the drawing/specification and record the outcome.

2) **Teaching Aids:** All relevant tools, drawings, checklists, assessment sheets.

3) Introduction

- (1) Review: Link the prerequisite knowledge/skill to the current topic.
- (2) Motivation: Explain how accurate, safe execution supports workshop productivity and employability.

II. PRESENTATION:

Developments / Topics	Information Points	Hints
1) Integrated revision of first-year competencies	1. Review the major first-year areas: safety, fitting, sheet metal, welding, drilling/tapping, fits, lathe, maintenance, Engineering Drawing and WCS. 2. Connect related skills—for example drawing → marking → machining → measurement → inspection. 3. Reinforce correct terminology, tool selection, sequence and safe working behaviour. 4. Use short diagnostic questions to identify topics requiring re-teaching.	Teaching: Integrated revision of first-year competencies. Use demonstration, questioning and guided practice; verify the result before moving on.
2) Practical assessment and evidence	1. Plan an integrated practical task with clear dimensions, process steps and acceptance criteria. 2. Observe tool selection, setup, work holding, operation, measurement, housekeeping and final inspection. 3. Collect evidence through completed jobs, measurements, drawing/calculation sheets, oral questioning and trainee records. 4. Give corrective feedback and document competence gaps for further practice.	Teaching: Practical assessment and evidence. Use demonstration, questioning and guided practice; verify the result before moving on.

Fitter Head of Department:

Developments / Topics	Information Points	Hints
3) Project/OJT planning	1. Introduce project selection based on first-year skills, available tools/materials and achievable dimensions. 2. Read the project/job drawing and list operations, tools, materials, measurements and safety controls. 3. Prepare a simple process sequence and estimate time/material requirements without compromising safety. 4. Explain how workshop records and completed work can support OJT readiness.	Teaching: Project/OJT planning. Observe performance, ask checking questions and give corrective feedback before final acceptance.
4) Final quality and progression review	1. Verify that all critical safety behaviours are demonstrated consistently. 2. Check practical workmanship, dimensional accuracy, drawing/calculation accuracy and ability to self-inspect. 3. Review maintenance/housekeeping discipline and correct use of workshop resources. 4. Use the final assessment to identify strengths, gaps and the next learning priorities.	Teaching: Final quality and progression review. Observe performance, ask checking questions and give corrective feedback before final acceptance.

III. APPLICATION:

- 1) Which first-year competencies are integrated in this assessment?
- 2) Which tool/instrument, calculation method or drawing convention is critical in this lesson?
- 3) State two safety or quality checks required before accepting the work.

Summary: Summarize the lesson with reference to objectives, procedure, safety and quality checks.

IV. TEST:

Assessment: integrated practical task + viva-voce + written check + review of trainee record.

Assignment: Complete a practical test/mini project plan and revise weak areas.

Reference: Fitter CTS 2.0 / NSQF-4 syllabus; supplied syllabus document; Bharat Skills lesson-plan master format.

Next Lesson: Final review and competency assessment

JTO/VI

TO/Section I/c

Fitter Head of Department: