

## LESSON PLAN

Trade: Machinist & Operator Advance Machine Tool  
 Date: 08.02.2021  
 Lesson No: 3

Module/Unit: 1  
 Time: 45 minutes

### I. PREPARATION:

Title: INSIDE MICROMETER

1. Objectives: *At the end of the lesson the trainees will be able to:*
  - *State the functions of parts of an Inside micrometer.*
  - *State working principle of micrometer.*
  - *Determine the least count of Inside micrometer.*
  - *Read Inside micrometer measurements*
2. Teaching Aids: *White board, Maker, Pointer, Duster, Chart, model, Visualizer, Projector etc.*
3. Introduction
  - a. Review: *In the previous lesson, we took the information about outside micrometer.*
  - b. Motivation: Motivate about taking inside measurements.

### II. PRESENTATION:

Developments / Topics	Information Points	Hints
Parts of an outside micrometer	Similar to outside micrometer without U frame. Measurement is taken over contact points. Barrel has adjustment of 13 mm. When closed minimum dimension is 25 mm. By opening reading is taken up to 38 mm & expanded up to 50 mm using spacing collar. <ul style="list-style-type: none"> <li>➤ Barrel/sleeve - fixed to frame &amp; datum line &amp; graduations are marked on this.</li> <li>➤ Thimble - graduations are marked on the beveled surface &amp; spindle is attached to it.</li> <li>➤ Anvil - one of measuring faces located on micrometer head.</li> <li>➤ 12 mm spacing collar — used to add reading.</li> <li>➤ Extension rods - ranges from 50-75, 75-100, 100-125, 125-150.</li> </ul>	Show chart / model  
Working principle	Screw & nut. Longitudinal movement of spindle in one rotation is equal to pitch of screw. This distance or its fractions can be accurately measured on barrel & thimble.	Ask questions

Least count of an Inside micrometer	Pitch of spindle thread is 0.5 mm. In one rotation of thimble, spindle advances 0.5 mm. On barrel 13 mm datum line is marked. This line is further graduated to millimeters & half millimeters and numbered as 0, 5, 10 & 13 Circumference of bevel edge of thimble is graduated into 50 equal divisions & marked as 0, 5, 10, 15, 40, & 45 in CW direction. Movement of one division of thimble = $0.5 \times 1/50 = 0.01 \text{ mm}$	Ask questions
Reading of an inside micrometer	<ul style="list-style-type: none"> <li>➤ Note minimum range of inside micrometer. For 100-125 extension rod, minimum range is 100 mm.</li> <li>➤ Check whether spacing collar is used &amp; add 12 mm into minimum range.</li> <li>➤ Read complete millimeters on barrel graduations &amp; add it.</li> <li>➤ Read whether half millimeter is completed after complete millimeters &amp; add it.</li> <li>➤ Read thimble graduations in line with datum line. Multiply this by 0.01 mm &amp; add it.</li> </ul>	Give assignment

### III. APPLICATION:

Summary: Explain parts, working principle, least count & reading of inside micrometer

### IV. TEST:

- 1) What is minimum range of inside micrometer?
- 2) What is use of extension rods of an inside micrometer?

Assignment: How least count is determined in inside micrometer?

Reference: NIMI - Machinist trade Theory.

Next Lesson: *Special Micrometers*

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