

**GOVT.POLYTECHNIC NAYAGARH**  
**DEPARTMENT OF MECHANICAL ENGINEERING**

**LESSON PLAN**

**SUBJECT:** MATERIAL TESTING AND METALLOGRAPHY LAB (PR-2) **SEMESTER:** 3rd  
**PERIODS:** 4P/WEEK **NO. OF WEEKS:** 15  
**NAME OF FACULTY:** SANTOSH KUMAR PATRA, Lecturer Stage I  
**SEMESTER FROM:** 14/07/2025 to 15/11/2025

Week	Class Day	Theory / Practical Topics
1st	1st Period	Preparation and examination of microstructure of Ferrous and Non-ferrous metals (Theory of Experiment)
	2nd Period	Preparation and examination of microstructure of Ferrous and Non-ferrous metals (Practical Session)
2nd	1st Period	Preparation and examination of microstructure of Ferrous and Non-ferrous metals (Practical Session)
	2nd Period	Preparation and examination of microstructure of Ferrous and Non-ferrous metals (Checking Lab Record with Viva Voce)
3rd	1st Period	Crack detection using Visual inspection and ring test (Theory of Experiment)
	2nd Period	Crack detection using Visual inspection and ring test (Practical Session)
4th	1st Period	Crack detection using Die penetration test (Theory of Experiment)
	2nd Period	Crack detection using Die penetration test (Practical Session)
5th	1st Period	Crack detection using Magnetic particle test (Theory of Experiment)
	2nd Period	Crack detection using Magnetic particle test (Practical Session)
6th	1st Period	Crack detection methods (Checking Lab Record with Viva Voce)
	2nd Period	Determination of Rockwell's Hardness Number for various materials (Theory of Experiment)
7th	1st Period	Determination of Rockwell's Hardness Number for various materials (Practical Session)
	2nd Period	Determination of Rockwell's Hardness Number for various materials (Checking Lab Record with Viva Voce)
8th	1st Period	Impact resistance testing by Izod and Charpy tests (Theory of Experiment)
	2nd Period	Impact resistance testing by Izod and Charpy tests (Practical Session)
9th	1st Period	Impact resistance testing by Izod and Charpy tests (Checking Lab Record with Viva Voce)
	2nd Period	Torsion test on mild steel (Theory of Experiment)
10th	1st Period	Torsion test on mild steel (Practical Session)
	2nd Period	Torsion test on mild steel (Checking Lab Record with Viva Voce)
11th	1st Period	Tensile test on mild steel (Theory of Experiment)

	2nd Period	Tensile test on mild steel (Practical Session)
12th	1st Period	Tensile test on mild steel (Checking Lab Record with Viva Voce)
	2nd Period	Spring testing - modulus of rigidity, strain energy, shear stress (Theory of Experiment)
13th	1st Period	Spring testing - modulus of rigidity, strain energy, shear stress (Practical Session)
	2nd Period	Spring testing (Checking Lab Record with Viva Voce)
14th	1st Period	Shear test on M.S. bar (Theory of Experiment)
	2nd Period	Shear test on M.S. bar (Practical Session)
15th	1st Period	Shear test on M.S. bar (Checking Lab Record with Viva Voce)
	2nd Period	Revision & Final Lab Record Submission

#### REFERENCES:

1. Measurement system (Application and Design) – Ernest O Doebelin.
2. Strength of Materials – R. S. Khurmi, S. Chand Company Ltd. Delhi
3. A Text Book strength of Material – R.K. Bansal, Laxmi Publication New Delhi



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