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| Image result for nit meghalaya logo | **National Institute of Technology Meghalaya**An Institute of National Importance | **CURRICULUM** |
| Programme | **Bachelor of Technology in Civil Engineering** | Year of Regulation | **2019-20** |
| Department | **Civil Engineering** | Semester | **III** |
| CourseCode | Course Name | **Pre requisite** | Credit Structure | Marks Distribution |
| L | T | P | C | Continuous Assesment | Total |
| **CE251** | **Solid Mechanics Lab** | **Nil** | **0** | **1** | **2** | **2** | **1 experiment** | **10** | **100** |
| CourseObjectives | 1. To understand the basic concepts of solid mechanics
 | Course Outcomes | CO1 | To understand the basics about the subject and practically verify them |
| 1. To introduce the concept of stress strain and deformation due to internal actions.
 | CO2 | To understand about the hardness test |
| 1. To analyze solid mechanics problems using classic methods and energy methods
 | CO3 | To understand about the Uniaxial test under tension and compression |
| 1. To apply various failure criteria for general stress state at a point
 | CO4 | To understand about the torsional test |
|  | CO5 | To understand about the impact test |
| No. | COs | Mapping with Program Outcomes (POs) | Mapping with PSOs |
| PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | CO1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 2 | CO2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 3 | CO3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 4 | CO4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 5 | CO5 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| SYLLABUS |
| No. | Content | Hours | COs |
| I | **Introduction to the laboratory**  | **04** | **CO1** |
| II | **Hardness test:** To determine the hardness of a given set of specimens by Brinell hardness testing machines | **02** | **CO2** |
| III | **Hardness test:** To determine the hardness of a given set of specimens by Vickers hardness testing machines | **02** | **CO2** |
| IV | **Hardness test:** To determine the hardness of a given set of specimens by Rockwell hardness testing machines | **02** | **CO2** |
| V | **Uni-axial tension test:**To obtain the stress-strain relation of mild steel using a circular cylindrical Specimen and determine 1. Young’s modulus (E),
2. proportional limit (p),
3. yield stress (y),
4. Ultimate tensile stress (u) and percentage elongation.
 | **02** | **CO3** |
| VI | **Uni-axial compression test:**To obtain the stress-strain relation of mild steel using a circular cylindrical Specimen and determine 1. Young’s modulus (E),
2. proportional limit (p),
3. yield stress (y),
4. Ultimate tensile stress (u) and percentage elongation.
 | **02** | **CO3** |
| VII | **Torsion test**: To obtain twisting moment- twist relationship of a mild steel specimen. To determine 1. shear modulus G,
2. yield stress y in pure shear, theoretical and experimental ultimate torque based on elastic-perfectly plastic model of material.
 | **02** | **CO4** |
| VIII | **Impact Test**To determine the toughness or impact strength of a given specimen by Izod Impact testing machine | **02** | **CO5** |
| IX | **Impact Test**To determine the toughness or impact strength of a given specimen by Charpy Impact testing machine | **02** | **CO5** |
| X | Revision and doubt clearing sessions | **04** | **CO1** |
| Total Hours | **24** |  |
| **Essential Readings** |
| 1. Kazimi S.M.A., “Solid mechanics-First revised edition”, Tata McGraw Hill.; Twenty sixth edition, 2006
 |
| 1. Popov E. P., “Engineering Mechanics of Solids”, Dorling Kindersley (India) Pvt Ltd; Second edition, 1999
 |
| 1. Timoshenko, S.P. and Gere, J.M., Mechanics of Materials, Tata McGraw Hill, First edition, 1992.
 |
| **Supplementary Readings** |
| 1. Srinath L. S., “Advanced Solid Mechanics”, Tata McGraw Hill; Third edition, 2010
 |
| 1. Pitarresi J.M., “Introduction to Solid Mechanics”, Prentice Hall of India; Third edition, 2000
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