

## **STRENGTH OF MATERIALS LAB CONTENT**

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# Lab Manual Of Strength Of Materials

**IM Harris**



## Lab Manual Of Strength Of Materials:

*Strength of Materials Lab Manual* Anand A, 2020-11-06 Strength of Materials Laboratory Manual is an exercise book for the Strength of Materials Laboratory course. It contains 13 exercises that are part of the course LIST OF EXPERIMENTS 1 Tension test on a mild steel rod 2 Double shear test on Mild steel and Aluminium rods 3 Torsion test on mild steel rod 4 Impact test on metal specimen 5 Hardness test on metals Brinnell and Rockwell Hardness Number 6 Deflection test on beams 7 Compression test on helical springs 8 Strain Measurement using Rosette strain gauge 9 Effect of hardening Improvement in hardness and impact resistance of steels 10 Tempering Improvement Mechanical properties Comparison i Unhardened specimen ii Quenched Specimen and iii Quenched and tempered specimen 11 Microscopic Examination of i Hardened samples and ii Hardened and tempered samples

**Laboratory Manual of Testing Materials** William Kendrick Hatt, Herbert Henry Scofield, 1926 Laboratory Manual on Strength of Materials J. D. Lubahn, Colorado School of Mines, 1975

*Mechanics of Materials Laboratory Manual* G. A. Olsen, 1943 **A Laboratory Manual of Metals and Alloys** S. M. Ashraf, 2008-12-08 This compendium of twenty laboratory experiments on metals and alloys attempts to provide to students of Science and Engineering an insight about the relationship of the physical specially mechanical properties of metals with grain structures microstructures. In almost all the experiments therefore the microstructural investigation is provided. Experiments have also been included on the determination of important mechanical and thermal properties and on the aqueous and atmospheric corrosion of metals. Theoretical background of each experiment has been dealt with in good detail in order to enable the student to understand the underlying principles and to appreciate the significance of the experiments. Information which could not be accommodated given in the text of the experiments has been provided in the form of appendices. These include reflection microscopy experimental determination of transition points through cooling curves to get data for plotting phase diagrams and quenching media for tempering of alloys. In view of the importance of microstructures for some metals and alloys have also been given Catalog of Course of Instruction at the United States Naval Academy United States Naval Academy, 1953 **Laboratory Manual** William Ditmer Jordan, William K. Rey, 1966

A Laboratory Manual of Organic Chemistry for Beginners Arnold Frederick Holleman, 1913 *Laboratory Manual on Biotechnology* P. M. Swamy, 2008 Lab Manual Latest Edition Dr. J. P. Goel, 2016-12-17 Lab E Manual Physics For XIIth Practicals A Every student will perform 10 experiments 5 from each section 8 activities 4 from each section during the academic year Two demonstration experiments must be performed by the teacher with participation of students. The students will maintain a record of these demonstration experiments B Evaluation Scheme for Practical Examination One experiment from any one section 8 Marks Two activities one from each section 4 4 8 Marks Practical record experiments activities 6 Marks Record of demonstration experiments Viva based on these experiments 3 Marks Viva on experiments activities 5 Marks Total 30 Marks Section A Experiments 1 To determine resistance per cm of a given wire by plotting a graph of

potential difference versus current 2 To find resistance of a given wire using metre bridge and hence determine the specific resistance of its material 3 To verify the laws of combination series parallel of resistances using a metre bridge 4 To compare the emf of two given primary cells using potentiometer 5 To determine the internal resistance of given primary cells using potentiometer 6 To determine resistance of a galvanometer by half deflection method and to find its figure of merit 7 To convert the given galvanometer of known resistance and figure of merit into an ammeter and voltmeter of desired range and to verify the same 8 To find the frequency of the a c mains with a sonometer

**Activities**

- 1 To measure the resistance and impedance of an inductor with or without iron core
- 2 To measure resistance voltage AC DC current AC and check continuity of a given circuit using multimeter
- 3 To assemble a household circuit comprising three bulbs three on off switches a fuse and a power source
- 4 To assemble the components of a given electrical circuit
- 5 To study the variation in potential drop with length of a wire for a steady current
- 6 To draw the diagram of a given open circuit comprising at least a battery resistor rheostat key ammeter and voltmeter Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram

**Section B Experiments**

- 1 To find the value of  $v$  for different values of  $u$  in case of a concave mirror and to find the focal length
- 2 To find the focal length of a convex lens by plotting graphs between  $u$  and  $v$  or between  $1/u$  and  $1/v$
- 3 To find the focal length of a convex mirror using a convex lens
- 4 To find the focal length of a concave lens using a convex lens
- 5 To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation
- 6 To determine refractive index of a glass slab using a travelling microscope
- 7 To find refractive index of a liquid by using i concave mirror ii convex lens and plane mirror
- 8 To draw the I V characteristic curve of a p n junction in forward bias and reverse bias
- 9 To draw the characteristic curve of a zener diode and to determine its reverse break down voltage
- 10 To study the characteristics of a common emitter npn or pnp transistor and to find out the values of current and voltage gains

**Activities**

- 1 To study effect of intensity of light by varying distance of the source on a L D R
- 2 To identify a diode a LED a transistor and IC a resistor and a capacitor from mixed collection of such items
- 3 Use of multimeter to i identify base of transistor ii distinguish between npn and pnp type transistors iii see the unidirectional flow of current in case of a diode and a LED iv check whether a given electronic component e g diode transistor or I C is in working order
- 4 To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab
- 5 To observe polarization of light using two Polaroids
- 6 To observe diffraction of light due to a thin slit
- 7 To study the nature and size of the image formed by i convex lens ii concave mirror on a screen by using a candle and a screen for different distances of the candle from the lens mirror
- 8 To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses

**Suggested Investigatory Projects**

- 1 To investigate whether the energy of a simple pendulum is conserved
- 2 To determine the radius of gyration about the centre of mass of a metre scale as a bar pendulum
- 3 To investigate changes in the velocity of a body under the action of a constant force and determine its acceleration
- 4 To compare effectiveness of different materials as

insulators of heat 5 To determine the wavelengths of laser beam by diffraction 6 To study various factors on which the internal resistance emf of a cell depends 7 To construct a time switch and study dependence of its time constant on various factors 8 To study infrared radiations emitted by different sources using photo transistor 9 To compare effectiveness of different materials as absorbers of sound 10 To design an automatic traffic signal system using suitable combination of logic gates 11 To study luminosity of various electric lamps of different powers and make 12 To compare the Young s modulus of elasticity of different specimens of rubber and also draw their elastic hysteresis curve 13 To study collision of two balls in two dimensions 14 To study frequency response of i a resistor an inductor and a capacitor ii RL circuit iii RC circuit iv LCR series circuit

**Course of Instruction at the United States Naval Academy** United States Naval Academy,1953 **Lab Manual for Investigating Chemistry** David Collins (Ph. D.),Matthew Johll,2008-12-02 While many of the core labs from the first edition have been retained a renewed focus on the basics of chemistry and the scientific process create an even more detailed supplemental offering **Harmonic Functions** William Elwood Byerly,1906 **Catalog of Course of Instruction** United States Naval Academy,1953 **Experimental Strength of Materials** K.A. Holes,1962

**Experimental Engineering and Manual for Testing** Rolla Clinton Carpenter,Herman Diederichs,1913 **Who's who in Engineering** ,1922 *The Publishers' Trade List Annual* ,1980 *Manual Training Magazine* Charles Alpheus Bennett,William Thomas Bawden,1928 Catalogue Kansas State Agricultural College,Kansas State College of Agriculture and Applied Science,Kansas State University,1925

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