



JAYPEE UNIVERSITY OF ENGG. & TECHNOLOGY, GUNA
B.TECH., I YEAR, I SEMESTER, SESSION 2020-21

Physics Lab-I (18B17PH171)

List of Experiments

1. To study the variation of magnetic field along the axis of Helmholtz Galvanometer and to determine its reduction factor.
 2. To determine the resistance per unit length of a Carey Foster's bridge and to obtain the specific resistance of a given wire.
 3. To determine the wavelengths of spectral lines Red, Green and Violet of mercury using plane transmission grating.
 4. To determine the specific rotation of cane sugar solution using Bi-quartz polarimeter.
 5. To observe Newton's rings and to determine the wavelength of sodium light.
 6. To study the CRO and function generator by producing the following waveforms.
 - i. 10kHz, $8V_{p-p}$ (sine wave, square wave, triangular wave)
 - ii. 4kHz, $6V_{p-p}$ (sine wave, square wave, triangular wave)
 - iii. 10kHz, $8V_{peak}$ (sine wave, square wave, triangular wave)
 - iv. 4kHz, $6V_{peak}$ (sine wave, square wave, triangular wave)
 7. To verify the Kirchhoff's current law.
 8. To verify the Kirchhoff's voltage law.
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Learning Outcomes

Course Outcome	Description
CO1	Demonstrate ability to collect experimental data and understanding the working procedures within the precautionary limits
CO2	Acquired the ability to analyze the experimental data and related errors in a reflective, iterative and responsive way
CO3	Developed understanding of the basic concepts related to Modern Physics, Basic Solid State Physics and Optics
CO4	Acquired a first hand and independent experience of verifying Kirchoff's circuit laws and related concepts e.g. resistivity, measurement of resistance
CO5	Appreciate the importance of the laboratory work culture and ethics that is intended to impart features like regularity, continuity of self evaluation and honesty of reporting the data



JAYPEE UNIVERSITY OF ENGG. & TECHNOLOGY, GUNA

B.TECH., I YEAR, II SEMESTER, SESSION 2020-21

Physics Lab-II

Experiments List

1. To determine the magnetic susceptibility of a paramagnetic, FeCl_3 solution by Quinck's tube method.
 2. To determine dispersive power of a prism using spectrometer.
 3. To study the magnetostriction in metallic rod using Michelson-Interferometer.
 4. To determine the Planck's constant using Photo electric effect.
 5. To study the Hall effect in P type semi conductor and to determine
 - (i) Hall voltage and Hall coefficient
 - (ii) Number of charge carriers per unit volume
 - (iii) Hall angle and mobility
 6. To study the variation of resistivity of a semiconductor with temperature and to determine the band gap using Four-Probe method.
 7. To study the presence of discrete energy levels in an atom by Franck Hertz experiment.
 8. Using solar cell Trainer (a) study voltage and current of a solar cell (b) Voltage and current in series and parallel combinations (c) Draw power curve to find maximum power point (MPP) and to obtain efficiency of a solar cell.
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Course Outcome	Description
CO1	Demonstrate ability to collect experimental data and understanding the working procedures within the precautionary limits
CO2	Acquired the ability to analyze the experimental data and related errors in a reflective, iterative and responsive way
CO3	Developed understanding of the basic concepts related to Modern Physics, Basic Solid State Physics, Optics,
CO4	Acquired a first hand and independent experience of verifying the working principle of solar cell
CO5	Appreciate the importance of the laboratory work culture and ethics that is intended to impart features like regularity, continuity of self evaluation and honesty of reporting the data



JAYPEE UNIVERSITY OF ENGG. & TECHNOLOGY, GUNA

B.sc. I year I semester

Physics Lab-I

1. Using Vernier Callipers
 - (i) Measure the diameter of a small spherical/cylindrical body.
 - (ii) Measure the dimensions of a given regular body of known mass and hence find its density.
 - (iii) Measure the internal diameter and depth of a given beaker and hence find its volume
2. Using Screw-gauge
 - (i) Measure diameter of a given wire.
 - (ii) Measure thickness of a given sheet.
3. To find the weight of a given body using parallelogram law.
4. To determine the force constant K and mass of the flat spiral spring by statistical and dynamical method..
5. Using simple pendulum determine the acceleration due to gravity.
6. To determine the value of Young's modulus of the material from the flexure of a beam supported on two knife-edges and loaded at its middle point.
7. To determine the modulus of rigidity of the material of wire with the help of a torsional pendulum.
8. To determine the radius of curvature of a convex lens by spherometer

Course Outcome	Description
CO1	Develop the ability to collect experimental data and understanding the working procedures within the precautionary limits
CO2	Acquired the ability to analyze the experimental data and related errors in a reflective, iterative and responsive way
CO3	Demonstrate understanding of the basic concepts related to classical mechanics
CO4	Acquired an enhanced understanding of the theory course "Mechanics and relativity" offered in parallel
CO5	Appreciate the importance of the laboratory work culture and ethics that is intended to impart features like regularity, continuity of self evaluation and honesty of reporting the data



JAYPEE UNIVERSITY OF ENGG. & TECHNOLOGY, GUNA

B.sc. I year II semester

Physics Lab-II

1. To determine the coefficient of thermal conductivity of mica sheet (bad conductor) by Lee's disc method
2. To convert a Weston galvanometer into an ammeter of a given range
3. To study the variation of magnetic field along the axis of Helmholtz Galvanometer and to determine its reduction factor
4. To verify the Ohm's law
5. To observe Newton's rings and to determine the wavelength of sodium light
6. To study the presence of energy levels in an atom by Franck-Hertz Experiment
7. To determine the specific rotation of cane sugar solution using Biquartz polarimeter
8. To determine the surface tension of a liquid by capillary rise method

Course Outcome	Description
CO1	Develop the ability to collect experimental data and understanding the working procedures within the precautionary limits
CO2	Acquired the ability to analyze the experimental data and related errors in a reflective, iterative and responsive way
CO3	Demonstrate understanding of the basic concepts related to general properties of matter, optics and modern physics
CO4	Acquired an enhanced understanding of the theory course "Electricity and Magnetism" offered in parallel
CO5	Appreciate the importance of the laboratory work culture and ethics that is intended to impart features like regularity, continuity of self evaluation and honesty of reporting the data



JAYPEE UNIVERISTY OF ENGG. & TECHNOLOGY, GUNA
B.sc. II year III semester

Physics Lab-III

1. To study the Photo-Electric effect and to determine the value of the Planck's constant.
2. To study the variation of resistivity of a semiconductor with temperature and to determine the band gap using Four-Probe method
3. To study the dielectric constant and Curie temperature of Ferroelectric ceramics.
4. To determine value of specific charge e/m for an electron by Thomson method
5. To determine the resistance per unit length of a Carey Foster's bridge and to obtain the specific resistance of a given wire
6. To determine the Planck's constant using Wien's displacement law
7. To study the CRO and function generator by producing the following waveforms.
 - a. 10kHz, $8V_{p-p}$ (sine wave, square wave, triangular wave)
 - b. 4kHz, $6V_{p-p}$ (sine wave, square wave, triangular wave)
 - c. 10kHz, $8V_{peak}$ (sine wave, square wave, triangular wave)
 - d. 4kHz, $6V_{peak}$ (sine wave, square wave, triangular wave)
8. To determine the wavelength of Laser light by diffraction grating

Course Outcome	Description
CO1	Develop the ability to collect experimental data and understanding the working procedures within the precautionary limits
CO2	Acquired the ability to analyze the experimental data and related errors in a reflective, iterative and responsive way
CO3	Demonstrate understanding of the basic concepts related to Modern physics, working of CRO , basic properties of semi conductors
CO4	Acquired an enhanced understanding of the theory course "Quantum Mechanics" offered in parallel
CO5	Appreciate the importance of the laboratory work culture and ethics that is intended to impart features like regularity, continuity of self evaluation and honesty of reporting the data



JAYPEE UNIVERSITY OF ENGG. & TECHNOLOGY, GUNA
B.sc. II year IV semester

Physics Lab-IV

1. To determine the refractive index of the material of a convex lens
2. To determine the wavelengths of spectral lines Red, Green and Violet of mercury using plane transmission grating
3. To study Hall effect in a P type semiconductor. To determine
 - (i) Hall voltage and Hall coefficient
 - (ii) Number of charge carriers per unit volume
 - (iii) Hall angle and mobility
4. Using solar cell Trainer (a) study voltage and current of a solar cell
(b) Voltage and current in series and parallel combinations. (c) Draw power curve to find maximum power point (MPP) and to obtain efficiency of a solar cell
5. To determine the magnetic susceptibility of a paramagnetic, FeCl_3 solution by Quinck's tube method
6. To determine dispersive power of a prism using spectrometer
7. To determine, using Fiber Optic kit
 - (i) Numerical Aperture of the fiber
 - (ii) Losses in given fiber
8. To study the magnetostriction in metallic rod using Michelson- Interferometer

Course Outcome	Description
CO1	Develop the ability to collect experimental data and understanding the working procedures within the precautionary limits
CO2	Acquired the ability to analyze the experimental data and related errors in a reflective, iterative and responsive way
CO3	Demonstrate understanding of the basic concepts related to optics, working of solar cells and optical fiber
CO4	Acquired an enhanced understanding of the theory course "Waves & Optics" offered in parallel
CO5	Appreciate the importance of the laboratory work culture and ethics that is intended to impart features like regularity, continuity of self evaluation and honesty of reporting the data