Semester 6 Major
Course- 363P
(Major Course – 4 Credits)

Semester: 6	**Course No.: 363(P)**	**Course Code:** PHM 363(P) **Course Title:** Physics lab
Credits: 4	1 Session = 2 hour	**Course Category: Major Paper**

Course objectives:

The course objectives for physics lab generally focus on developing practical skills in measurement, experimentation, and understanding of fundamental concepts in optical physics and electronic circuits.
Key objectives include:

- Understanding and applying principles of optics through hands-on experiments such as measuring physical quantities, optical phenomena and verifying theoretical laws.
- Gaining proficiency with electronic instrumentation and optical instruments like Michelson interferometer, Giger muller counter, Electromagnets, digital multimeter, AFO, CRO etc.
- Developing the ability to interpret experimental data, analyse errors, and relate practical observations to theoretical physics concepts.
- Learning to operate and maintain physics laboratory equipment used in mechanics and electronics

Course Outcomes:

On successful completion of the course, learners will be able to.

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CO1	Set up the instruments as per the instructions, Connect the circuit as given in the circuit diagram.	**Remember** **Understand**
CO2	Develop measurements techniques, record observations, use the given formula, do calculations and draw your conclusion from the result..	**Understand** **Apply**
CO3	Find uncertainty involved in the observations	**Evaluate**
CO4	Analyse the observations for scientific inference	**Analyse**

Unit No.	Unit Contents	Sessions Allotted
1	**GROUP A** 1. Acceleration due to gravity by Kater's pendulum (variable knife edges). 2. Susceptibility of ferromagnetic substance by Quink's method (Magnetic fluid). 3. Comparison of relative intensities of different sources and Determination of Dead Time of G. M. Tube. 4. Study of absorption spectrum of Iodine molecules. 5. To determine 'dλ' using Michelson Interferometer. 6. Study of Edser-Butler plate and determine the unknown wavelength. 7. To determine Thermal Conductivity of Rubber Tubing. 8. Determine the energy eigen values of a particle (electron or proton) in a finite square well potential using Excel/origin software. 9. Exploring Time Dilation. Verify with theoretical values for 20 different speeds Simulation Link https://www.walter-fendt.de/html5/phen/timedilation_en.html 10. To determine wavelength of LASER beam using plane diffraction grating	**60 Hours**

2	**GROUP B** 1. Study of UJT as a relaxation oscillator using CRO. 2. Study of R-S Flip Flop using gates (IC – 7400, 7402) and D Flip Flop using IC - 7474. 3. Study of OP-AMP as an Adder and Subtractor using IC – 741. 4. The temperature coefficient of resistance for platinum using PRT (Platinum resistance thermometer) 5. Half Adder, Full Adder and Subtractor using IC – 7483 6. Frequency response of common source FET amplifier. 7. Study of Colpitts Oscillator (transistorized) and measurement of frequency by CRO. 8. Study of Negative feedback on CE amplifier. 9. Study of voltage regulated circuit using IC7805. 10. Low pass and high pass filter	**60 Hours**

Reference books:

1. B.Sc. Practical Physics by C. L. Arora, 20th Edition, 2020 S. Chand and Company
2. Practical Physics by G. L. Squires. 4th edition, Cambridge, 2001.
3. Practical Physics with viva – voce Dr. S. L. Gupta and Dr. V. Kumar, 22nd edition, 1997 Pragati Prakashan
4. Advanced Practical Physics I & II by Chauhan and S.P. Singh, Pragati Prakashan vol. 1 & 2.
5. Practical Electronics Experiments: A Comprehensive Guide by B. M. Rajesh.
6. An advanced course in Practical Physics by D. Chattopadhyay & P. C. Rakshit, New central Book Agency (P), Kolkata.