Course: PHY11-8L
Section: EM01
Group Name: FELI & FRIENDS
Name: Jose Andres A. Ofrin
Experiment 5: Magnetic Force and Magnetic Field

Goals, observe magnetic field around per relat

For the first part of the experiment we placed a bond paper each over a bar magnet, a horseshoe magnet, two bar magnets with the same poles facing each other, and two bar magnets with opposite poles facing each other, we then sprinkled iron filings over the bond paper for each. The sprinkled iron filings on the paper placed on the single bar magnet, formed curved lines extending from the north to the south pole, denser near the poles and spreading out elsewhere. For the horseshoe magnet, the filings created a U-shaped pattern with tightly packed lines between the close poles. With two bar magnets placed like poles facing each other, the filings showed a repulsive pattern, with a sparse neutral zone between the poles and curved lines around each magnet. When opposite poles of two bar magnets faced each other, the filings formed continuous, dense lines connecting the poles. Then, we connected a solenoid to a 6v power source and measured its current, length and number of turns to calculate its theoretical magnetic field value, repeating this for 4.5v power source and then 3v power source. Since the current lowered every time we lowered the power source, the theoretical magnetic field of the solenoid lowered as well.

This experiment demonstrated key principles of magnetism and electromagnetism, with real-life applications in electric motors, generators, and medical imaging devices like MRI machines. Through visualizing magnetic fields using iron filings, I learned how field patterns vary with magnet configurations, such as bar magnets, horseshoe magnets, and interacting poles. The solenoid experiment highlighted the relationship between current and magnetic field strength, a concept critical for designing electromagnets and energy-efficient devices. This hands-on experience improved my skills in experimental setup, data measurement, and theoretical calculations, while also deepening my understanding of electromagnetism's role in technology. Possible extensions could explore different core materials or alternating current effects, further bridging theory and practical applications.