Catholic Memorial HIGH SCHOOL

Year Long Course Plan

Department: Science **Course: IB Physics SL 754/755**

Essential Learning Outcomes: After successfully completing this course, students will be able to:

I. Demonstrate an understanding of:
   a. Scientific facts and concepts
   b. Scientific methods and techniques
   c. Scientific terminology
   d. Methods of presenting scientific information.

II. Apply and use:
   a. Scientific facts and concepts
   b. Scientific methods and techniques
   c. Scientific terminology to communicate effectively
   d. Appropriate methods to present scientific information.

III. Construct, analyze and evaluate:
   a. Hypotheses, research questions and predictions
   b. Scientific methods and techniques
   c. Scientific explanations.

IV. Demonstrate the personal skills of cooperation, perseverance and responsibility appropriate for effective scientific investigation and problem solving.

V. Demonstrate the manipulative skills necessary to carry out scientific investigations with precision and safety.

In any given unit of IB Physics, students practice all of the ELO's required by the IB Science Curriculum.

Quarter 1	*Quarter 2*
Unit 01: Physics and physical measurement • **The realm of physics** • **Measurement and uncertainties** • **Vectors and scalars** **Unit 02: Mechanics** • **Kinematics** • **Forces and dynamics** • **Work, energy and power** • **Uniform circular motion**	**Unit 03: Thermal physics** • **Thermal concepts** • **Thermal properties of matter** **Unit 04: Oscillations and waves** • **Kinematics of simple harmonic motion (SHM)** • **Energy changes during simple harmonic motion (SHM)** • **Forced oscillations and resonance** • **Wave characteristics** • **Wave properties**
Quarter 3	***Quarter 4***
Unit 05: Electric currents • **Electric potential difference, current and resistance** • **Electric circuits** **Unit 06: Fields and forces** • **Gravitational force and field** • **Electric force and field** • **Magnetic force and field** **Unit 07: Atomic and nuclear physics** • **The atom** • **Radioactive decay** • **Nuclear reactions, fission and fusion**	**Unit 08: Energy, power and climate change** • **Energy degradation and power generation** • **World energy sources** • **Fossil fuel power production** • **Non-fossil fuel power production** • **Greenhouse effect** • **Global warming** **Unit 09: Quantum physics and nuclear physics** • **Quantum physics** • **Nuclear physics** **Unit 10: Relativity and particle physics** • **Introduction to relativity** • **Concepts and postulates of special relativity** • **Relativistic kinematics** • **Particles and interactions** • **Quarks**