IMMACULATE CONCEPTION HIGH SCHOOL
PHYSICS SYLLABUS SEQUENCE 2023/2024
GRADE 11
TERM 2

WEEK:	DATE	TOPICS	OBJECTIVES
1	Jan. 10 – 12	**Revision**	The students will review topics for their mock exams.
2-4	Jan. 15 – 19 Jan. 22 -26 Jan. 29 - 30	**MOCK EXAMS**	There will be no classes. Complete marking of: - the Investigative Projects - Unmarked Labs - Mock Exam Scripts.
4 (cont'd)	Jan 31 - Feb. 1	**Electrical Quantities**	**LAB : Falling Bead in a liquid (PD)** **Resistance, R** • explain the concept of resistance; • apply the relationship R= V/I • explain why it is necessary for an ammeter to have a very low resistance; • explain why it is necessary for a voltmeter to have a very high resistance; • solve problems involving series and parallel resistance; • solve problems involving series, parallel and series-parallel circuits; **I - V Relationships** • investigate the relationship between current and potential difference;
5	Feb. 5 - 9	**Electronics**	**LABS: I-V relationships & Series and Parallel Circuits** **Alternating Current** • differentiate between direct and alternating currents;

			• analyze current-time or voltage-time graphs. • deduce the period and frequency of ac. or voltages **Rectification** • describe how a semi-conductor dioxide can be used in half wave rectification; • differentiate between direct current from batteries and rectified alternating current by a consideration of the $V - t$ graphs for both cases; **Logic Gates** • recall the symbols for AND, OR, NOT, NAND, NOR logic gates; • state the function of each gate with the aid of truth tables; • analyze circuits involving the combinations of not more than three logic gates; • discuss the impact of electronic and technological advances on society. **Electricity in the Home** • discuss the reasons for using parallel connections of domestic appliances; • explain the purpose of a fuse or circuit breaker and the earth wire; • select a fuse or circuit breaker of suitable current rating for a given appliance; • state the adverse effects of connecting electrical appliances to incorrect or fluctuating voltage supplies.
6	**Feb. 12 - 14** **MID-TERM BREAK** **Feb. 15 - 16**	**Electromagnetism**	<mark>**Review of Mock Exam Paper**</mark>

7	**Feb 19 - 23**	**Electromagnetism**	<mark>**Current Electricity, Electrical Quantities, Circuits & Components & Logic Gates (Coursework)**</mark> **Electromagnetic Force** • conduct simple experiments to investigate the magnetic field pattern around current-carrying conductors; • apply suitable rules which relate the direction of current flow to the direction of the magnetic field; • describe a commercial application of an electromagnet; • conduct an experiment which demonstrates the existence of a force on a current-carrying conductor placed in a magnetic field; • sketch the resultant magnetic flux pattern when a current carrying wire is placed perpendicular to a uniform magnetic field; • apply Fleming's left- hand (motor) rule; • identify the factors that affect the force on a current-carrying conductor in a magnetic field; **Motors** • explain the action of a D.C. motor;
8	**Feb. 26 - March 1**	**Electromagnetism**	<mark style="background-color:#00ff00">**Lab: Refraction**</mark> **Induced e.m.f.** • describe simple activities which demonstrate an induced e.m.f.; • conduct simple experiments to show the magnitude of the induced e.m.f. • predict the direction of induced current given the direction of motion of the conductor and that of the magnetic field; • explain the action of the A.C. generator; **Transformers** • explain the principle of operation of a transformer; • state the advantages of using a.c. for transferring electrical energy;

			• apply the ideal transformer formula Pout = Pin.
9 + 10	**March 4 - 8**	**Waves**	**<u>Types of Waves</u>** • differentiate between types of waves **<u>Wave Parameters</u>** • recall the meaning of speed, frequency, wavelength, period, amplitude, phase, and solve problems involving these; • represent transverse and longitudinal waves in displacement-position and displacement-time graphs; • extract information about wave parameters from graphs representing waves. **Wave Phenomena** Reflection, Refraction, Diffraction • describe reflection, refraction and diffraction of water waves; • recall all waves undergo reflection, refraction and diffraction; • illustrate: (a) reflection of plane and circular wavefronts at plane surfaces; • relate refraction at a plane boundary to change in speed across the boundary; • recall that the frequency remains unchanged after refraction and use the relationship: $$\frac{\sin \theta_1}{\sin \theta_2} = \frac{v_1}{v_2} = \frac{\lambda_1}{\lambda_2}$$ to solve problems on refraction; Superposition • explain interference of waves in terms of superposition; • predict the effect on a 'double slit' interference pattern of changing the slit spacing or the wavelength of the waves.

11	**March 18 - 22**	**Waves**	**Light Waves** <u>Waves or Particles</u> • compare rival theories of light held by scientists; • describe a simple Young's slit experiment to show that light is a wave motion; <u>Rays of Light</u> • explain why the diffraction of light is not normally observed; • recall that light travels in straight lines and give examples **Reflection and Refraction of Light** <u>Laws of Reflection</u> • state and apply the laws of reflection; <u>Image in a Plane Mirror</u> • describe the formation of images in a plane mirror; <u>Refraction</u> • give examples of observations that indicate that light can be refracted; • describe the refraction of light rays; <u>Laws of Refraction</u> • state the laws of refraction and use Snell's Law to solve numerical problems; <u>Critical Angle and Total Internal Reflection</u> • explain with the aid of diagrams what is meant by 'critical angle' and 'total internal reflection'; • calculate critical angles and relate to total internal reflection; • draw diagrams illustrating applications of total internal reflection; <u>Dispersion</u>

			• describe how a prism may be used to produce a spectrum from a source of white light; • discuss the significance of Newton's prisms experiments for scientific methodology.
12	**March 25 - 28** **Easter Break** **March 28 - April 5**	**Waves**	**Lenses** Action of Lenses • illustrate the effect of converging and diverging lenses on a beam of parallel rays; • recall the meaning of the terms: (a) principal axis; (b) principal focus; (c) focal length; (d) focal plane; (e) magnification;