| **IMMACULATE CONCEPTION HIGH SCHOOL**  **PHYSICS SYLLABUS SEQUENCE 2023/2024** | | | |
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| **GRADE:** | **11** |  |  |
| **TERM:** | **1** |  |  |
| **WEEK:** | **DATE** | **TOPICS** | **OBJECTIVES** |
| **1** | **Sept.**  **11 - 15** | **Revision** | **Review the grade 10 End of Year Exam Paper**  **Meet with IP students** |
| **2** | **Sept.**  **18 – 22** | **Thermal Physics** | **Conduct an experiment to** determine ***c*** for metals and liquids using:   * Methods of Mixtures   **Discuss Experiment**:  - Determine the specific latent heat of vaporization ***lv***, and fusion, ***lf*** of water  Review Thermal Physics group assignments. |
| **3** | **Sept.**  **25 – 29** | **Thermal Physics** | Gas Laws   1. Use the relationship between Kelvin and Celsius scale. T/K = θ/℃ + 273; 2. Relate pressure/volume against temperature graphs to the establishment of the Kelvin temperature scale 3. Explain gas pressure in terms of molecular motion 4. Apply the gas laws: Boyle’s Law; Charles’ Law; Pressure Law; General Gas Law; |
| **4** | **Oct. 2 - 6** | **Physics of the atom** | **Course Work # 1 - Thermal Physics**  Models of the Atom   * describe the work done in establishing the modern view of the atom; * describe the Geiger-Marsden experiment which established the nuclear structure of the atom.   Particles in the Atom   * sketch the structure of simple atoms; * compare the mass and charge of the electron with the mass and charge of the proton; * explain why an atom is normally neutral and stable; * recall and use the relationship A = Z + N; * explain what is meant by the term “isotope”;   relate the shell model of the atom to the periodic table. |
| **5** | **Oct.**  **9 - 13**  **(3 Teaching days)**  **Mid-term : Oct 12 – 16** | **Radioactivity** | Radioisotopes   * discuss the useful applications of radioisotopes;   Radioactive Emissions   * describe Marie Curie’s work in the field of radioactivity; * state the nature of the three types of emissions from radioactive substances; * describe experiments to compare the ranges of ∝, β and γ emission * interpret nuclear reactions in the standard form; * describe the appearance of the tracks of radioactive emissions in a cloud chamber; * predict the effects of magnetic and electric fields on the motion of ∝,β particles and γ rays; |
| **6** | **Oct.**  **16 - 20** | **Oct. 16 is Heroes Day** | **Same as Week 5** |
| **7** | **Oct.**  **23 – 27** |  | **FIRST SIX WEEKS TEST** |
| **8** | **Oct.**  **30 - Nov. 3** | **Radioactivity** | Half-life   * use graphs of random decay to show that such processes have constant half-lives; * solve simple problems involving half-life; * recall that the decay process is independent of the conditions external to the nucleus;   Nuclear Energy   * relate the release of energy in a nuclear reaction to a change in mass; * cite arguments for and against the utilization of nuclear energy. * Application of Einstein’s equation: **E = mc2**. |
| **9** | **Nov.**  **6 - 10** | **Magnetism** | LAB: Half-Life (Coins)  **Permanent Magnets**   * 6.1 differentiate between magnetic and non-magnetic materials; * 6.2 explain how a magnet can attract an object; * 6.3 distinguish between materials used to make "permanent" and "temporary" magnets; * 6.4 identify the poles of a magnetic dipole;   **Magnetic Forces**   * 6.5 investigate the forces between magnetic poles; * 6.6 define a magnetic field; * 6.7 map magnetic fields.   NOTE: Magnetism was taught in Grade 9 so treat it as a revision topic. |
| **10** | **Nov.**  **13 - 17** | **Electrostatics**    **Current Electricity**  **Circuits and Components** | | **Electric Charge, Q**   * + explain the charging of objects;   + describe the forces that electric charges exert on each other;   + explain charging by induction;   + describe one hazard and one useful application of static charge | | --- |   **Electric Field**   * + define an electric field;   + Draw the electric fields around and between point charges, and between charged parallel plates;   + distinguish between conductors and insulators;   + state that an electric current in a metal consists of a flow of electrons;   + differentiate between electron flow and conventional current;   + state the unit of electrical current;   + apply the relationship Q = I t   **Power, P and Energy, E**   | * cite examples of the conversion of electrical energy to other forms and vice versa; | | --- |  * apply the relationship V = E/Q; * apply the relationship P =IV ; * discuss the importance of conserving electrical energy and the means of doing so.   **Circuit Diagrams**   * use symbols to construct circuit diagrams; * differentiate between series and parallel circuits |
| **11** | **Nov.**  **20 – 24** | **Circuits and Components**  **Current Electricity** | **Cells**   * explain the functions of the various parts of a zinc-carbon cell; * distinguish between primary and secondary cells; * draw a circuit diagram to show how a secondary cell can be recharged;  | **Resistance, R**   * explain the concept of resistance; * State Ohm’s Law * 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; | | --- | | **I - V Relationships** | | * solve problems involving series, parallel and series-parallel circuits; * investigate the relationship between current and potential difference; | |
| **12** | **Nov. 27 – Dec. 1** | **Electronics** | **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;   LAB: I-V relationships |
| **13** | **Dec. 4 - 8** |  | **SECOND SIX WEEKS TEST** |
| **14** | **Dec.**  **11 - 15** | **Electromagnetism** | LAB: Series and Parallel Circuits  **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.   **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. |
| **15** | **Dec.**  **18 - 19**  **Dec. 19**  **Sports’ Day** |  | **REVISION**  END OF TERM – Dec. 19 |