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| **Fundamental Physics** |
| **Transcript**  | **Fundamnental Physics** |
| **Subject Group** | Group 4: Sciences  |
| **Overview** | This course can run for 3 semesters, however, students can complete semester 1 without necessarily completing semester 2 or 3.**Semester** 1 is a basic introduction to studying physical concepts. This is designed for students who are interested in Physics, but are not yet sure if they want to extend this interest into their future studies.**Semester 2** covers more advanced concepts. Students wishing to study Physics at IB SL or HL in the future should have completed a minimum of semesters 1 and 2.**Students who have selected to study IGCSE Physics should not sign up for semesters 1 and 2.** **Semester 3** extends students understanding and knowledge in preparation for HL Physics.**Students who sign up for semester 3 must either be studying IGCSE Physics or must have already completed semesters 1 and 2.**This course will be a mixture of practical work, scientific research, theoretical understanding, application of knowledge, communication, presentation and teamwork skills. This is a rigorous course and is recommended only for committed and highly motivated students. Organization and study skills will also be monitored. |
| **Future Learning** | Students wishing to study Physics at IB SL or HL in the future should have completed a minimum of semesters 1 and 2 or IGCSE Physics.It is recommended that students wishing to study IB HL Physics should complete semester 3. This course is designed for students who are interested in studying a Science related course at university in the future. |
| **Student Experiences and Outcomes** | **Semester 1:** This first introductory part of the course covers some general and important physical concepts and practical techniques. Students will cover topics such as forces, acceleration, moments, density, pressure, electricity and circuits, energy changes, energy resources and power. Students will get an opportunity to explore these concepts in depth and carry out some extended practical work, plus some experimental and theoretical research projects.**Semester 2:** This builds on the concepts and practical techniques experienced in the first semester. Students explore slightly more advanced principles on topics such as light/sound waves, electromagnetic radiation, magnetism, electromagnetism, generating and using electricity and radioactivity.Students who have completed semesters 1 and 2, displaying the necessary aptitude and motivation, would have sufficient credit to be considered for entry into an IB Physics SL course. **Semester 3:** In the final semester, students would face more advanced physical experimental techniques and more complex principles to really prepare them for IB HL Physics. Concepts covered would include momentum and astronomy, further astrophysics and further electromagnetic waves and communication.It is recommended that all students wishing to study an IB Phyiscs HL course should study enroll for semester 3. |
| **Student Skills** | **Communication by** * Presenting answers, explanations and ideas using appropriate scientific terms, either in writing, verbally or using digital media..
* Organise scientific information logically.
* Take effective notes in class.
* Communicate understanding in science using mathematical notations and appropriate graphical techniques..
* Undertake background reading about science from textbooks and internet sources.
* Sharing scientific information with others to help improve understanding. This could include using social media or digital environments.
* Write for different purposes; Design experiments, draw conclusions and suggest appropriate evaluations.
* Make concise summary and revision notes to aid recall of information.

.**Collaboration by*** Manipulative skills; Carrying out practical investigations in groups
* Researching in teams: Collect, process and analyse information from a variety of sources, present this information using a range of media platforms.
* Presenting information or understanding as a team.
* Discussion skills leading to decision making or shared understanding.
* Listening, compromise and delegation skills also support, encouragement and conflict resolution.
* Problem solving; Collaboration to solve complex problems (both qualitative and quantitative) in teams.
* Giving and receiving meaningful feedback from others.

**Capacity to learn by:*** Mindfulness: An ability to focus, concentrate and display responsibility to complete tasks.
* Perseverance; Recall a wide range of specific and relevant scientific information.
* Abstract Thinking: Displaying understanding of abstract scientific principles using models and simulations whilst considering alternative perspectives and opposing arguments.
* Critical thinking skills: Apply knowledge to solve a wide range of both familiar and unfamiliar problems and questions in a range of contexts..
* Self management: Being organised, resilient and displaying self motivation.
* Transfer: being able to link and form connections between scientific concepts.
* Creativity & Innovative thinking; Make predictions, create novel solutions to complex problems, propose analogies and comparisons to aid understanding, design experiments and test out hypothesis, critically analyse the strengths and weaknesses of established theories.
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| **Assessment** | There will be a number of skills based assessments. However, theoretical knowledge and understanding will also be tested. |