I. INSTRUCTIONAL RESOURCES:

1. **Text**: *Physics first* by George B. and David C. (1999). Oxford University Press, N.Y. U.S.A.
2. **Other**:

David Sang. (2010). Cambridge IGCSE Physics Course book. Cambridge University Press, U.S.A.

Christopher N. Prescott (2009). Lower Secondary SCIENCE Book A. Marshall Cavendish Education, U.S.A.

Fong, J., et. al. (2012). Lower Secondary SCIENCE Matters Practical Book. Marshall Cavendish Education, U.S.A.

Mitton, S., et. al. (2003). Astronomy. Oxford University Press, U.S.A.

II. COURSE PREREQUISITE:

Students must meet the minimum requirements of the Asian International School to demonstrate English proficiency to understand the fundamental concepts in Physics taught during the course, to perform well in the laboratory and to be able to actively participate in all the classroom activities.

III. COURSE DESCRIPTION

The Pre-Intermediate Physics course covers all the physical processes that the students need for Key Stage 3 of the National Curriculum. However, in many places it goes into much greater depth, helping the students to develop the kind of understanding needed to gain the highest grades in their SATs. It also provides a solid foundation for those preparing for GCSE.

The course covers many important topics, particularly those that affect us in our everyday lives, distributed in to four chapters. Since Physics is more than just learning from books, however good they are, a lot of practical work/ laboratory experiments pertaining to the topics are also included to develop important experimental skills as well as to make students thorough with the topic. The experiments are developed in such a way to develop scientific inquiry and critical thinking skills.

Project work is also included as part of the course to develop research skill among students. Overall the course is structured in such a way to engage even the weaker students in to the world of Physics.

IV. COURSE GOALS

At the end of this course, students will be able to achieve the following:

1. Students will use inquiry strategies to investigate and understand the natural world.
2. Students will demonstrate an understanding of key concepts and principles central to the physical, and earth sciences.
3. Students will demonstrate an understanding of the basic laws which govern and explain phenomena observed in the natural world.
4. Students will demonstrate an understanding of, and can practice, the basic processes that scientists use to obtain and continually revise knowledge about the natural world.
5. Students will perceive that scientific and technological knowledge is the result of the cumulative efforts of people, past and present, who have attempted to explain the world through an objective, peer-tested, rational approach to understanding natural phenomena and occurrences.
6. Students will display a sense of curiosity and wonder about the natural world, and demonstrate an increasing awareness of the interdependence between all living things and the environment.
7. Students will demonstrate their abilities to identify human needs and concerns and to engage in problem-solving processes to define the problem, research and generate solutions, and develop simulations and prototypes to test their ideas before implementation.
8. Students will be able to apply rational, creative-thinking, and investigative skills and use scientific and technical knowledge in their roles as citizens, workers, family members, and consumers in an increasingly technological society.
9. Students will use oral and written communication, mathematical representation, and physical and conceptual models to describe and explain scientific concepts and ideas, and will be able to apply scientific and technical knowledge.
10. Students will know and employ safe practices and techniques in the laboratory, in fieldwork or any other scientific investigation, and when using scientific or technological materials at home or work.

V. COURSE OBJECTIVES

At the end of this course, students will gain a higher level of understanding pertaining to the following objectives (**from *Common Core State Standards***):

- Represent or explain the relationship between or among energy, molecular motion, temperature, and states of matter.
- Investigate and explain the relationships among mass, volume and density
- Use data to draw conclusions about how heat can be transferred (convection, conduction, radiation)
- Measure distance and time for a moving object and using those values as well as the relationship s=d/t to calculate speed and graphically represent the data.
- Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.

- Describe the universe as containing many billions of galaxies, and each galaxy contains many billions of stars.
- Relate the motions of the Earth-Sun-Moon system to eclipses and the seasons.
- Compare and contrast planets based on data provided about size, composition, location, orbital movement, atmosphere, or surface features (includes moons).
- Explain how earth events (abruptly and over time) can bring about changes in Earth's surface: landforms, ocean floor, rock features, or climate.
- Explain how the relationship between the tilt of Earth's axis and its yearly orbit around the Sun produces the seasons.
- Students will demonstrate an understanding of the nature of scientific inquiry.
- Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyse and evaluate results, make predictions, and communicate findings.

VI. COURSE REQUIREMENTS

1. Assessments

The progress made by the students is measured in two ways during the course – (1) ongoing assessment or Formative assessment and (2) summative assessment. Summative assessment includes two achievement tests, mid-term (30%) and final (30%) in each semester, accounting for the assigned percentage of the overall course grades. The remaining percentage (40%) of students' grade will come under formative assessment and will come from assignment, hands-on project work, performance in the laboratory, and class performance (e.g., participation and attendance). In-class assessments will cover the course materials assigned. The summary of the assessment is as follows:

- Midterm Exam (30%)
- Final Exam (30%)
- Other (40%): Assignment, hands-on project work, performance in the laboratory, and class performance (e.g., participation and attendance).

2. Other Class Activities

Physics club is held in each semester to develop student's presentation skills as well as to monitor the progress made by the student in understanding the basic concepts of Physics.

VII. GRADING

The Physics grade will be based upon achievement tests (midterm and finals) and other course work (including hands-on projects, assignments, performance in the laboratory and class participation) designed, planned, and implemented by classroom teachers. Assessments of learning consist of the achievement tests which will comprise 80% of the overall grade, and other course work will make up the remaining20%. The following grading scale will be

operated separately in each semester. The scale is operated to translate letter grades into point values, and vice versa, when calculating student final grades.

Letter	Range	Percentages
A	90-100	90% (High Distinction)
B	80-89	80% (Distinction)
C	65-79	70% (Pass with merit)
D	50-64	60% (Pass)
F	0-49	Below 60% (Fail)

VIII. POLICIES

1. Foreign Teachers' Responsibilities

- All foreign teachers are expected to observe the guidelines provided by the school for their performances in and out of the classroom and the standard dress code.
- All foreign teachers are expected to write school reports at the end of each SEMESTER giving comments to each student with respect to their progress, achievements, classroom performances, and all other significant matters in their academic learning and development.
- All foreign teachers are expected to write school reports at the end of an ACADEMIC YEAR in regards to student progress, achievements, classroom performances, and all other significant activities during the entire academic year that have crucially contributed to students' academic achievements.
- All foreign teachers who teach Physics are responsible for facilitating special class activities, including club activities, hands-on project and laboratory experiment. Foreign teachers in charge of Physics are also responsible for reporting the results of student activities to school.

2. Students Responsibilities

- Students must respect instructors and all other students at school. This includes respecting alternative opinions and different points of view, listening to instructors and peers when speaking to the class, and refraining from insulting body language and gestures.
- Students must be alert on needs and requirements in the classroom setting. This includes arriving on time and participating in the entire class period (or letting the instructor be notified in advance if this is not possible), turning off cell phones and similar devices during class, staying away from doing other activities, including reading comic books, passing notes, chatting with friends, and causing any other potentially disruptive activities.

- Students are responsible for participating in other class activities, including speaking club activity and reading club activity, and for meeting the requirements set for those activities.

- Failure in abiding by these policies will result in consequences based on school policies and regulations.

3. Writing Assignments and Policies

- For all writing assignments prepared outside of class, students will be trained throughout the academic year to document all information that is not their original thought, interpretation, analysis, or synthesis. This includes both direct quotes (phrases or sentences taken from another source, surrounded by quotation marks) and paraphrases (rewordings and summaries of ideas or analyses that are not theirs). Among **the systems of citation (i.e., University of Chicago, Modern Language Association, American Psychological Association, etc.)**, students should learn very basic required citations. All research papers should utilize footnotes, endnotes, or citations within the text, and should include references at the end.
- Failure in observing the academic integrity with respect to writing assignments will result in consequences based on school policies and regulations.

IX. COURSE SCHEDULE

UNIT	TITLE	CONTENT	TIME	NOTES
SEMESTER 1			**18 WEEKS**	
2	**MOTION**	➢ Frame of Reference ➢ Speed ➢ Measuring Speed ➢ Position-Time Graph ➢ Speed-Time Graphs ➢ Changing speed and direction ➢ Experiment 1 – Position-Time graph ➢ Experiment 2 – Speed-Time graph	Aug.	**Refer* https://isaacphysics.org/concepts/cp_frame_reference *2. Cambridge IGCSE Physics Coursebook by David Sang p. 16* *Check with the Curriculum and Unit Mapping* *Textbook: Bethell, G. et. Al. 1999. Physics First. Oxford New York, U.S.A.*

2	**MOTION**	➢ Acceleration ➢ Slowing Things Down ➢ Stopping a Car ➢ *Newton's Laws of Motion ➢ Friction ➢ Gravity, Falling and Air Resistance ➢ Experiment 3 – First Law of Motion ➢ Experiment 4 – Second Law of Motion ➢ Experiment 5 – Third Law of Motion	Sep.	**Refer Oxford IB Diploma Programme Physics Course Companion book by Tim Kirk and Neil Hodgson p. 43-45* *Check with the Curriculum and Unit Mapping* *Textbook: Bethell, G. et. Al. 1999. Physics First. Oxford New York, U.S.A.*
1	**FORCES**	➢ Forces ➢ Force as a vector ➢ Various kinds of Forces ➢ Effect of Force on the Motion of Objects ➢ Elasticity and Springs ➢ More About Springs ➢ Experiment 6 – Hooke's Law	Oct.	**Mid-term Exam** ***Refer** C*ambridge IGCSE Physics Coursebook by David Sang p. 23* *Check with the Curriculum and Unit Mapping* *Textbook: Bethell, G. et. Al. 1999. Physics First. Oxford New York, U.S.A.*
1	**FORCES**	➢ Mass, Weight, and Gravity ➢ Balancing ➢ Balance and Stability ➢ Pressure ➢ Experiment 7 – Force and the Fulcrum	Nov.	*Check with the Curriculum and Unit Mapping* *Textbook: Bethell, G. et. Al. 1999. Physics First. Oxford New York, U.S.A.*
1	**FORCES**	➢ Pressure in Liquids ➢ Hydraulic Machines ➢ Experiment 8 – Liquid Pressure	Dec.	**Final Exam** **&** **Vietnamese Exam**
SEMESTER 2			**16 WEEKS**	

4 **3**	**Energy, work and fuels** **Solids, Liquids and Gases**	➢ Types of Energy ➢ Work and Energy ➢ Solids, Liquids, Gases ➢ Density ➢ Measuring Density ➢ Experiment 9 – Measuring Density	Jan.	*Check with the Curriculum and Unit Mapping* *Textbook: Bethell, G. et. Al. 1999. Physics First. Oxford New York, U.S.A.*
3	**Solids, Liquids and Gases**	➢ The Kinetic Theory of Matter ➢ Using the Kinetic Theory ➢ Molecular Motion and Temperature ➢ Changing State ➢ Experiment 10 –Changing Physical State	Feb.	**TET Holiday** **(with 2 weeks availability for classes)**
3	**Solids, Liquids and Gases**	➢ Heat ➢ Heat Conductivity ➢ Convection and Thermal Radiation ➢ Experiment 11: Heat Conductivity, Convection and Thermal Radiation	Mar.	**Mid-term Exam** ***Refer Cambridge IGCSE Physics Course book by David Sang p. 112-118** ***Ref. MOET, Vietnamese Curriculum**
8	**THE SOLAR SYSTEM**	➢ The planets of our Solar System ➢ Club Presentation and/or projects	Apr.	**Vietnamese Exam & Final Exam** **Project Making**
8	**THE SOLAR SYSTEM**	➢ Days, Months, Years ➢ The Seasons ➢ The Moon - the Earth's Satellite ➢ A Star Called the Sun ➢ Gravity - Keeping the Planets in Orbit ➢ Bullets, Missiles, Satellites ➢ Satellites ➢ Club Presentation and/or projects	May	*Check with the Curriculum and Unit Mapping* *Textbook: Bethell, G. et. Al. 1999. Physics First. Oxford New York, U.S.A.* **Club Presentations**
TOTAL: 4 UNITS			**34 WEEKS**	

REFERENCE(S):

AERO SCIENCE PERFORMANCE STANDARDS. (2012). AERO SCIENCE K-8 and High School STANDARDS with Progression/Performance Indicators, Document version 8-2012. Retrieved from: http://www.projectaero.org/aero_standards/science-standards/AERO-ScienceK-12Framework.pdf

AHS International Program Curriculum. (2017-2018). Retrieved from Campus Manager.

AHS Vietnamese Curriculum. (unknown). Retrieved from the library and consultations.