IB Physics

Syllabus and Course Outline

PSLHS

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Text: Higher level Physics by Hamper

Physics: Principles and problems Glencoe

Supplies: 3 ring binder, pencils, colored pens or pencils, composition notebooks with graph paper. Calculator: Casio or equivalent, or TI -84 graphing calculators or Tinspire calculators

Classroom supplies: paper towels, hand sanitizer, Ziploc bags (quart and gallon size)

Calculation of Grades

Laboratory: Approximately 40 hours of work, which includes 30 hours of lab and 10 hours of Group 4 project. Lab accounts for approximately 30% of total grade

Formative Assessment: this includes written assignments, projects, power points, development of special skill, etc . This accounts for 20% of the grade.

Tests and Quizzes: All exams will be in IB format, to better acclimate the students for the format used in May. Tests and quizzes will account for 50% of grade.

Syllabus

Topic 1:Physics and physical measurements. Including measurement and uncertainties, vectors and scalars 5 hours

Topic 2 Mechanic s, including kinematics, force and dynamics, work energy and power, and uniform circular motion. 17 hours

Topic 3 Thermal Physics: thermal concepts and thermal properties of matter. 7 hours

Topic4: Oscillations and waves: kinematics of simple harmonic motion (SHM), energy change during SHM, forced oscillations and resonance, wave characteristics and wave properties. 10hours

Topic 5: Electric currents, including electric potential difference and resistance, and electrical circuits. 7 hours

Topic 6: Fields and forces, including gravitational, electrical and magnetic fields and force. 7 hours

Topic 7: Atomic and nuclear physics, including the atom, radioactive decay, nuclear reactons including fission and fusion. 9 hours

Topic 8: Energy, power and climate change. 18 hours

Options topics: Each topic is roughly 15 hours of instruction, and include the following-Sight and wave phenomena, quantum physics, digital technology, relativity and particle physics, astrophysics, communications, and electromagnetic waves. We will do three of the options, time permitting.

Individual Assessments (IA's)

IA's are individual projects that students perform on selected topics. Students are instructed to take a physical event, evaluate it, collect data from the event, analyze the data, and describe what physical laws may apply or be demonstrated. We will do at least three (3) IA's during the year. These will count significantly toward the final score for the certificate, as well as the classroom score.

IA Lab Conversions for 9 week grading period for Group 4 Internal Assessment #1		Internal Assessment #2	
I.A. Total	Out of 100	I.A. Total	Out of 100
18	100	18	100
17	98	17	98
16	96	16	96
15	94	15	94
14	92	14	90
13	90	13	85
12	85	12	80
11	80	11	75
10	75	10	65
9	70	9	55
8	65	8	50
7	60	7	45
6	55	6	40
5	50	5	35
4	45	4	30
3	40	3	25
2	35	2	15
1	30	1	5
0	20	0	0

Overall grade boundaries

Higher level Grade:	1	2	3	4	5	6	7
Mark range:	0 - 26	27 - 36	37 - 49	50 - 61	62 - 74	75 - 87	88 - 100
	F	D	C	B	B	A	A

Internal assessment

Higher level Grade:	1	2	3	4	5	6	7
Mark range:	0 - 8	9 - 16	17 - 22	23 - 27	28 - 33	34 - 38	39 - 48
	F	D	C	B	B	A	A

Calculation of Grades for IBO:

External Paper 1 - multiple-choice questions that test knowledge of the core only for students at SL and the core and AHL material for students at HL.

External Paper 2 - of the core only for students at SL and the core and AHL material for students at HL. The questions address objectives 1, 2 and 3 and the paper is divided into two sections.

In section A, there is a data-based question that requires students to analyze a given set of data. The remainder of section A is made up of short-answer questions.

In section B, students at SL are required to answer one question from a choice of three, and students at HL are required to answer two questions from a choice of four. These extended-response questions may involve writing a number of paragraphs, solving a substantial problem, or carrying out a substantial piece of analysis or evaluation. A calculator is required for this paper.

External Paper 3 - knowledge of the options and addresses objectives 1, 2 and 3. Students at SL are required to answer several short-answer questions in each of the two options studied.

Internal Assessment - There are five assessment criteria that are used to assess the work of both SL and HL students.

- Design—D
- Data collection and processing—DCP
- Conclusion and evaluation—CE
- Manipulative skills—MS
- Personal skills—PS

The first three criteria—design (D), data collection and processing (DCP) and conclusion and evaluation (CE)—are each assessed twice.

Manipulative skills (MS) are assessed summatively over the whole course and the assessment should be based on a wide range of manipulative skills.

Personal skills (PS) are assessed once only and this will be during the group 4 project.

Each of the assessment criteria can be separated into three **aspects** as shown in the following sections. Descriptions are provided to indicate what is expected in order to meet the requirements of a given aspect **completely (c)** and **partially (p)**. A description is also given for circumstances in which the requirements are not satisfied, **not at all (n)**.

Group 4 Project - The group 4 project is an interdisciplinary activity in which all Diploma Programme science students must participate. The intention is that students from the different group 4 subjects analyze a common topic or problem. The exercise should be a collaborative experience where the emphasis is on the **processes** involved in scientific investigation rather than the **products** of such investigation