IB PHYSICS SL/HL

Teacher and Email	TBA TBA
Course Codes	IBPHYS1 and IBPHYS2, or IBPHYH1 and IBPHYH2
General Description	Physics is a science course which embodies the concept of the Nature of Science. This is the underlying principle that science is a framework which we use to understand the universe, by way of experiments, data collection, objective analysis of facts, and presentation of conclusions. Students will learn to appreciate the study of physics from a global point of view, by referring to current trends and discoveries in the scientific community. Communication of ideas and the ethical dimension of science will also be a focus of the IB Physics course. Students will develop their critical awareness of science, techniques to apply their skills and knowledge to further their own understanding and the understanding of others. In this course, students will study the universe from its most fundamental particles. Classical topics (such as mechanics, electromagnetism and waves) will be taught, as will more modern topics (such as quantum mechanics, and energy generation) The IB Physics course will have a significant experimental component, as students learn to investigate properties of the world and create their own investigations. Students must use traditional and modern scientific equipment in individual and group situations to improve their understanding of physics. Technology will be used to augment both experimental data gathering and students' understanding of core concepts. Students will construct mathematical models to simulate and explain observed phenomena.
Syllabus Breakdown + hours	Year 1 — Teaching hours Topic 1: Measurement and Uncertainties — 5 Topic 2: Mechanics — 22 Topic 3: Thermal physics — 11 Topic 4: Waves — 15 Topic 9: Wave phenomena (HL only) — 17 Topic 5: Electricity and Magnetism — 15 Topic 11: Electromagnetic Induction (HL only) — 16
	Year 2 — Teaching Hours **Group 4 Project (collaborative assignment for all science students)** — 10 Topic 6: Circular Motion and gravitation — 5 Topic 10: Fields (HL only) — 11 Topic 8: Energy Production — 8 Topic 7: Atomic, Nuclear, and particle physics — 14 Topic 12: Quantum and nuclear physics (HL only) — 16 Option Topic — 15 (SL) or 25 (HL)

Internal Assessment	**Scientific Investigation** **20% of final mark** (10 hours) Internal assessment is an integral part of the course and is compulsory for both SL and HL students, and it is the same for both levels. It enables students to demonstrate the application of their skills and knowledge, and to pursue their personal interests, without the time limitations and other constraints that are associated with written examinations. The internal assessment will be woven into normal classroom teaching.
External Assessments	**Paper 1** **Duration: ¾ hour (SL) or 1 hour (HL)** **Weighting: 20% (SL & HL)** **Marks: 30 (SL) or 40 (HL)** • 30 (SL) or 40 (HL) multiple-choice questions on material covered in class
	Paper 2 **Duration: 1¼ hours (SL) or 2¼ (HL)** **Weighting: 40% (SL) or 36% (HL)** **Marks: 50 (SL) or 72 (HL)** • Data-based question • Short-answer and extended-response questions on all topics covered, except the Option
	Paper 3 **Duration: 1 hour (SL) or 1¼ (HL)** **Weighting: 20% (SL) or 24% (HL)** **Marks: 35 (SL) or 45 (HL)** • Short answer and extended response questions, and an unseen data analysis question, based on all topics covered, including the Option
Examples of Practical Experiments	- Determining the acceleration of free-fall - Applying the calorimetric techniques of specific heat capacity or specific latent heat experimentally - Investigating the speed of sound - Determining refractive index experimentally - Investigating factors that affect electrical resistance - Investigating half - life experimentally or by simulation - Investigating Young's double – slit - Investigating a diode bridge rectification circuit

Resources

1. Bowden-Jones, Michael, and Homer, David, *Physics for the IB Diploma, Course Companion, 2014 Edition*, Oxford University Press, 2014
2. Kerr, Greg et al., *Physics 4th Edition*, IBID Press, 2014
   A variety of additional support material will be used in addition to the primary texts