

Sing Yin Secondary School
Physics Teaching Syllabus (2016-2017)

Form Six (for 6C, 6D & 6E)

Active Physics 5:	Radioactivity and Nuclear Energy S S Tong, H K Won, P K Kwong, Y L Wong, L C Lee
Active Physics 6:	Astronomy and Space Science S S Tong
Active Physics 7:	Atomic World L C Lee Pearson

Aims

This course of study should help students:

- ① learn the fundamental knowledge and method of Physics in a coherent, systematic and quantitative way,
- ② synthesize their knowledge, and think critically so that they can succeed in their future work or academic study,
- ③ develop skills relevant to the applications of Physics, such as experimental design, experimental technique and so on,
- ④ deepen their sense of carefulness and safety,
- ⑤ cultivate a respect for fact,
- ⑥ acquire a love of logical deduction,
- ⑦ appreciate the beauty and power of Physics,
- ⑧ be aware of the problems facing Hong Kong and mankind and how Physics can help to solve them, and
- ⑨ be able to apply what they learn to solve problems rationally in their academic and daily life.

Topics**Time allotted (cycle)**

1.	Laboratory safety regulations and general introduction	0.1
2.	Radiation and Radioactivity - X-rays and radioactivity - Nuclear radiation - Radiation safety - [Effect of radon gas in closed area]	1.9
3.	Atomic Model and Radioactive Decay - Atomic model - Radioactive decay - [Derivation of exponential law of decay]	0.5
4.	Nuclear Energy - Nuclear energy - Mass-energy relation	0.5

Topics**Time allotted (cycle)**

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| 5. | A Cosmic Journey
- A virtual journey of the cosmos | 0.5 |
| 6. | Astronomy through History
- Astronomy of the ancient Greeks
- Copernican revolution
- Kepler's laws of planetary motion | 0.5 |
| 7. | Newton's Law of Gravitation
- Orbital motion under gravity
- Apparent weightlessness
- Energy in orbital motion | 1 |
| 8. | Star and the Universe
- Stellar distance and magnitude
- Stellar spectrum
- Stellar luminosity and Hertzsprung-Russell diagram
- Radiation intensity and inverse square law
- Doppler effect
- Applications of the Doppler effect
- Dark matter and the expansion of the universe | 1.5 |
| 9. | Rutherford's Atomic Model
- The discovery of atomic structure
- Rutherford's atomic model
- Limitations of Rutherford's atomic model
- The importance of scattering experiments in particle physics | 0.5 |
| 10. | The Photoelectric Effect
- The photoelectric effect
- Properties of the photoelectric effect
- The quantum theory of light | 1.5 |
| 11. | Bohr's Atomic Model
- Line spectrum
- The Bohr's model of the hydrogen atom
- Spectral lines of the hydrogen atom | 1.5 |
| 12. | Wave-Particle Duality
- Wave-particle duality of light
- Matter waves
- Implications of the wave-particle duality | 0.5 |

Topics

Time allotted (cycle)

14. Probing into the Nanoscale 0.5
- Physical properties of materials in the nanoscale
 - Observing at the nanoscale
 - Recent development in nanotechnology

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[Topics added for challenge class]: These topics are out of syllabus but useful for the students who want to challenge themselves.

- END -

Signature of Teacher-in-charge:

Checked by:
