UCT Physics OpenContent - PHY1004W

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Course description

PHY1004W is a first-year, calculus-based introductory Physics course for Science students intending to continue with second-year Physics.

MODERN MECHANICS: Matter and interactions, conservation laws, the momentum principle, atomic nature of matter, conservation of energy, energy in macroscopic systems, energy quantization, multiparticle systems, exploring the nucleus, angular momentum, entropy, kinetic theory of gases, efficiency of engines.

ELECTRIC AND MAGNETIC INTERACTIONS: Electric fields, electric potential, magnetic fields, electric circuits, capacitance, resistance, magnetic force, Gauss' law, Ampere's law, Faraday's law, induction, electromagnetic radiation, waves and particles, semiconductor devices.

Lecture Slides

- Introduction to mechanics
- Motion
- Systems and surroundings
- Gravitational force
- Atoms and contact forces
- Atoms and energy
- Energy
- Energy quantisation
- Thermal physics
- Electricity and magnetism I
- Electricity and magnetism II
- Electricity and magnetism III
- Fields
- Faraday's law
- Electromagnetic radiation
- Waves and/or particles

Problem Sets

- WPS for week 0
- WPS for week 1
- WPS for week 2
- WPS for week 3
- WPS for week 4
- WPS for week 5
- WPS for week 6
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• WPS for week 23
• WPS for week 24

**Theory Tutorials**

• Theory tutorial 1
• Theory tutorial 2
• Theory tutorial 3
• Theory tutorial 4
• Theory tutorial 5
• Theory tutorial 6

**VPython Tutorials**

• VPython tutorial 0
• VPython tutorial 1
• VPython tutorial 2
• VPython tutorial 3
• VPython tutorial 4
• VPython tutorial 5