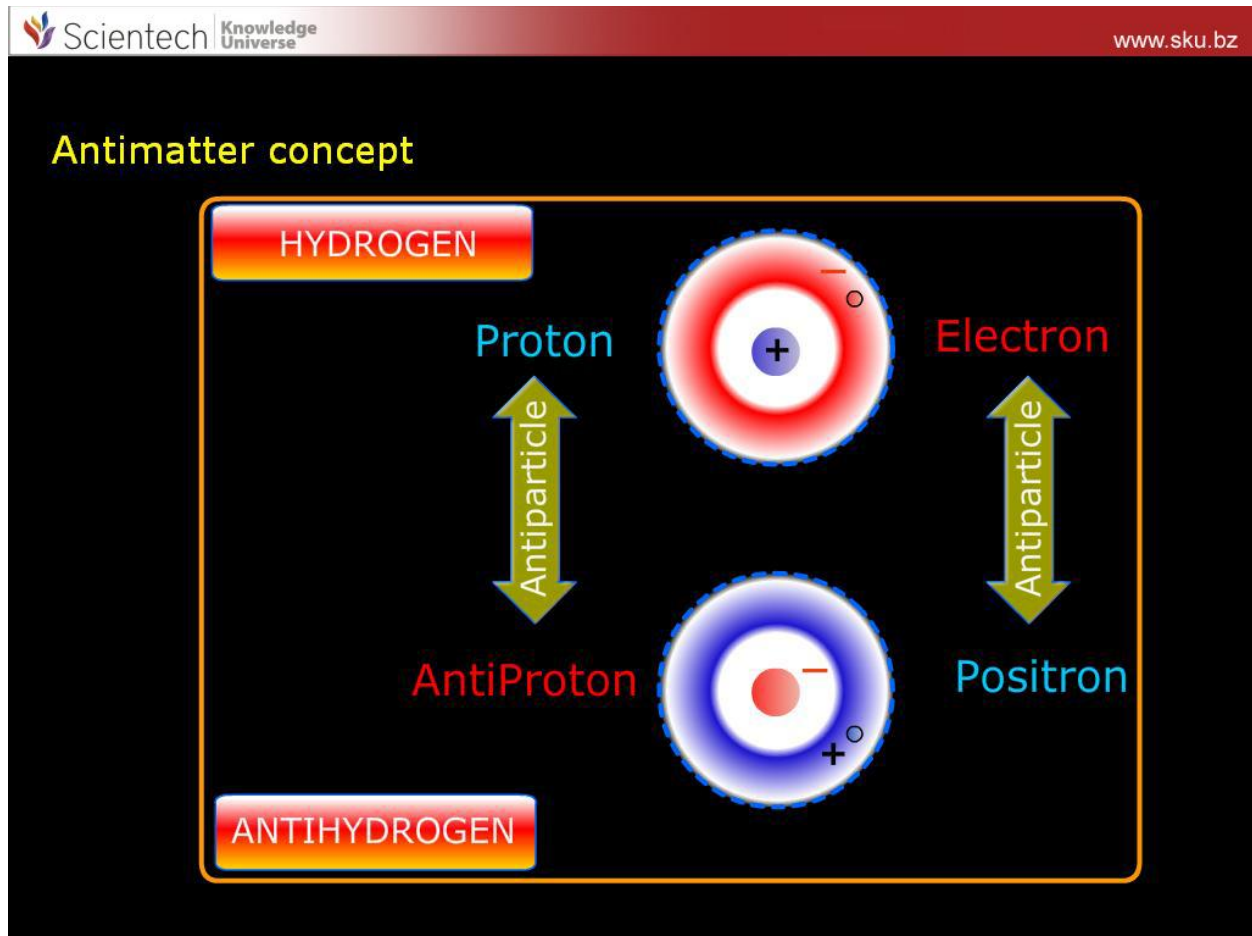


SKU-Engineering Physics

SKU-Engineering Physics course deals with concepts and applications of Engineering Physics. Syllabus of this course is divided into 5 units of equal weightage. We include quizzes which help learner to understand the depth of the basic concepts and device new applications.



Topics covered in SKU-Engineering Physics:

Quantum and Statistical Physics

Topics Covered: Origin of Quantum hypothesis, Planck's Approach, Debroglie's hypothesis of matter wave & its experimental verification, Group and particle velocities & their relations. Compton effect, Uncertainty principle with elementary proof & its application to Electron microscope, Wave function and its physical significance, general idea and application of time dependent and time independent Schrodinger wave equation, Potential step and its application, Rectangular lattice, Kronig – Penney model.

Microstates and Macro-state, Maxwell Boltzmann statistics, Bose – Einstein Statistics, Fermi – Dirac Statistics, Brillouin's Comment, Phase Space, Quasi Particles.

Physical Optics

Topics Covered: Interference: Fresnel's biprism, Interference in thin films, Newton's rings and Michelson's interferometer experiments, Diffraction at single slit, double slit and n-slit. Diffraction grating, Rayleigh criterion, resolving power of a telescope, grating and prism, Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter & half wave plate, Idea about circularly & elliptically polarized light.

Nuclear Physics

Topics Covered: Nuclear Structure & Nuclear properties, Quantitative treatment of nuclear models: liquid drop and shell models, Linear Particle accelerator, Cyclotron, Synchrotron, Synchrocyclotron, and Betatron, Nuclear cross section, chain reaction, critical size, Application of $E = mc^2$, Q-Value, Nuclear fusion & fission, Nuclear reactors, Geiger- Muller Counter, Bainbridge and Auston mass Spectrograph.

Semiconductors and Nano Physics

Topics Covered: Free Electron model of solids, Qualitative Analysis of Kronig Penny model, Effective mass, Fermi level for Intrinsic and Extrinsic Semiconductors: p-n junctions, Zener break down, photodiode, solar-cells, Hall Effect, Elementary idea about Nano structures and Nano materials.

Laser and Fiber Optics

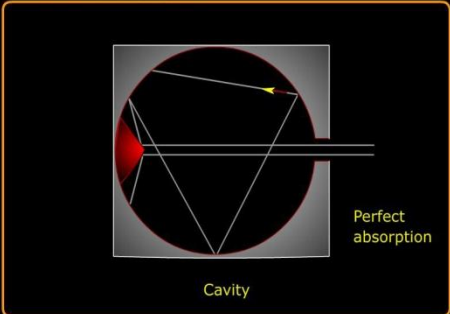
Topics Covered: Laser: Stimulated and spontaneous emission, Einstein's A & B Coefficients, transition probabilities, active medium, population inversion, pumping, Optical resonators, characteristics of laser beam. Coherence, directionality and divergence. Principles and working of Ruby, Nd:YAG, He-Ne & Carbon dioxide Lasers with energy level diagram, Fundamental idea about optical fiber, types of fibers, acceptance angle & cone, numerical aperture, V-number, propagation of light through step index fiber.

Print Shots of SKU-Engineering Physics:

Scienteck Knowledge Universe www.sku.bz

Black Body

- No material body in nature is perfectly black body i.e. absorbs all radiation completely.
- A hollow cavity with suitable arrangement inside, absorbs all the radiation which enters it.

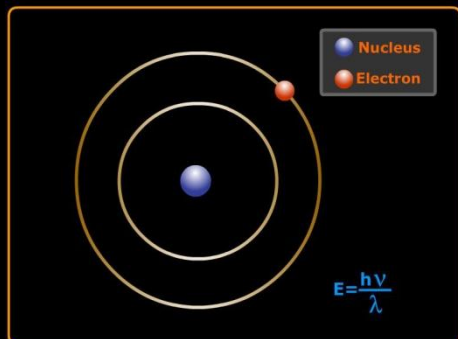


Perfect absorption

Cavity

Scienteck Knowledge Universe www.sku.bz

Bohr's Atomic Model



Nucleus

Electron

$$E = \frac{h\nu}{\lambda}$$

Comparison between Classical & Quantum Oscillator

Classical Approach
Wave

Quantum Approach
Wave Packet

An artistic view of global communication using optical fiber cables is shown below.

Satellite

Antenna

Telephone

Fax

Mobile

Computer

Thousands of glass fibers thinner than a single hair, bundled together in a cable.

The signal is amplified on route

Introduction

We know matter consists of atoms and molecules and which also have structure. It seems natural to ask what is the relation between bulk property of matter and properties and configuration of constituent atoms and molecules.

Atom

Molecule

Unit cell

Collection of Unit cell

This is also noted that even in a very small piece of matter the number of atoms and molecules is so large that properties of large number statistic can be used effectively.

Holography

