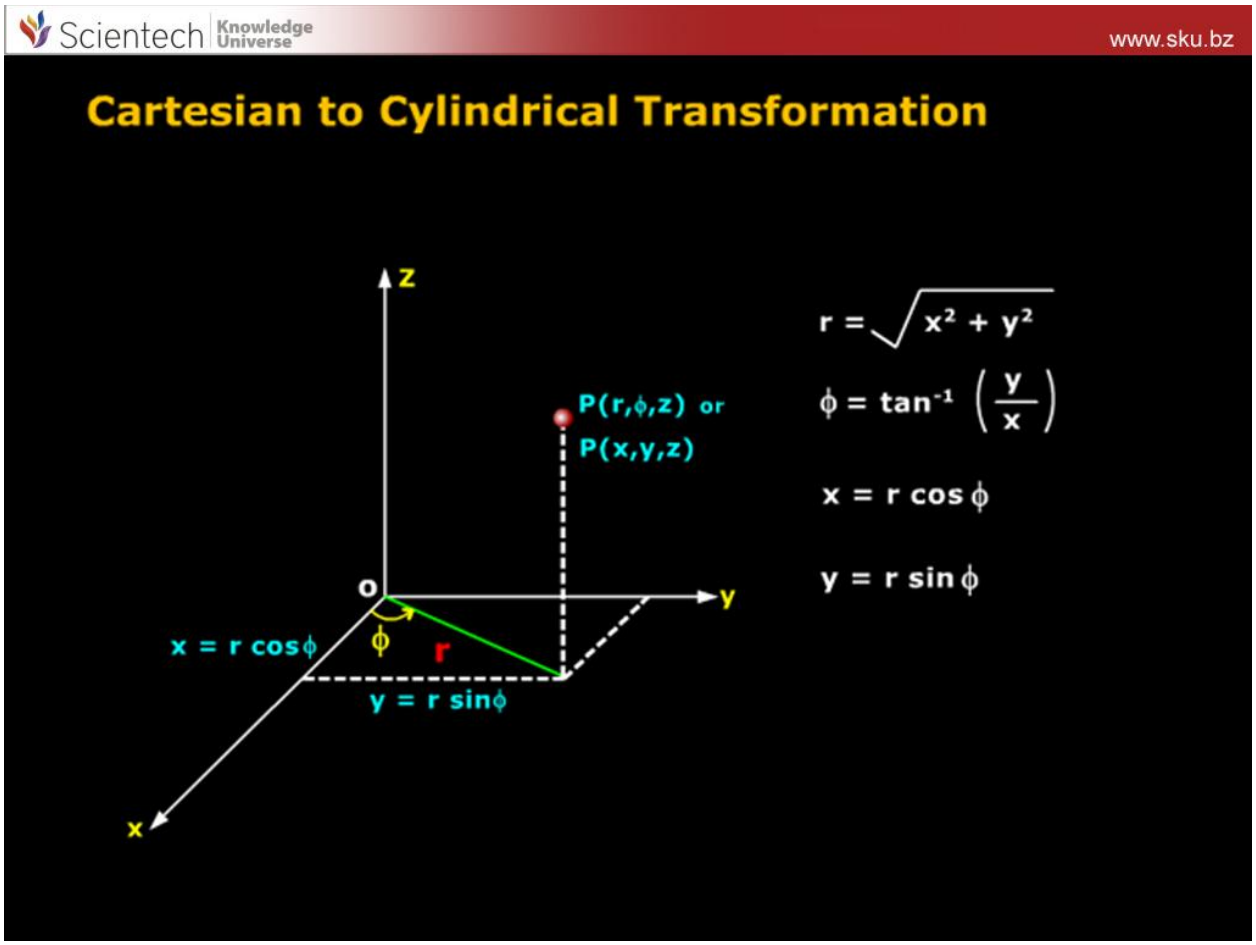
SKU-Electromagnetic Field Theory

SKU-Electromagnetic Field Theory explains electromagnetic concepts in a manner that is clearer, interesting, and easier to understand through innovative graphical user interface which is easy to learn and extremely efficient to use. The course is developed as a self-study package with easy-to-navigate interface, explaining difficult electromagnetic concepts by Flash animations, interactive examples, and numerical problems.



Topics covered in SKU-Electromagnetic Field Theory:

Coordinate Systems

Topics Covered: Cartesian Coordinate System, Cylindrical Coordinate System, Spherical Coordinate System, Differential length, area and volume in different Coordinate Systems, Line, Surface and Volume Integrals.

Vector Calculus

Topics Covered: Del, Gradient, Divergence and Curl in different Coordinate Systems, their properties, Laplacian, Divergence, and Stokes Theorem.

Electrostatics

Topics Covered: This unit covers electrostatics in detail, some of the main topics are Coulombs law, Principle of Superposition, Electric field intensity due to different charge distributions, Electric flux density, Gauss Law, Maxwell third equation, Application of Gauss's law, Electric potential, Electric Dipole, Energy, Current, Current density, Continuity equation, Relaxation time, Conductor properties, Boundary conditions, Poisson's and Laplace equation, Method of Images, Images for a point charge in a conducting plane.

Magnetostatics

Topics Covered: Biot-Savart's Law, Right hand rule, Ampere's circuit law, Differential form, First and second applications of ampere's law, Magnetic flux density, Magnetic flux, Law of conservation of magnetic flux, Magnetic scalar and vector potential, Force on a charge particle, Magnetic torque, Magnetic dipole moment, Magnetic boundary conditions, Magnetic dipole, Magnetization and permeability, Self-Induction, Mutual-Induction, Magnetic energy.

Maxwell's Equations and Electromagnetic Waves

Topics Covered: Faraday's-Lenz Law, Moving loop in static and time-varying fields, Displacement current, Retarded potential, Conversion of a vector into phasor form, Maxwell's equations in different forms, Helmholtz equation, Uniform plane waves and their propagation in Free space, Dielectrics and Conductors, Skin depth or Penetration depth. Poynting theorem, Poynting vector, Average power, Total power.

Polarization and Incidence of Electromagnetic Waves

Topics Covered: Polarization, Plane polarization, Vertical and Horizontal polarization, Superposition of Plane-Polarized Waves, Plane-Polarized Waves in an Absorbing and Refracting Medium. Circularly Polarized Waves; Right and Left Circularly Polarized Waves Circularly Polarized Waves in Absorbing Medium and Refracting Medium, Circular Birefringence, Elliptically Polarized Waves, Circular Dichroism, Reflection of a Plane Wave at Normal Incidence, Standing Waves, Standing Wave Ratio, Reflection of a Plane Wave at Oblique Incidence, Transmission Coefficient, Reflection Coefficient and Brewster angle of Parallel and Perpendicular Polarized Wave.

Print Shots of SKU-Electromagnetic Field Theory: