RTD LEARNING

Online classroom delivered via GoToTraining

Instructor: Chris Ferguson

Chris is a certified Alberta teacher and his biggest passion in life, next to his wife and two kids, is teaching physics!

Physics 30 Online Tutorial

Interactive online classroom – real-time communication with your instructor and classmates. Printable learning materials, assignments, and practice exams will be provided.

➔ **Access any missed classes** (or classes you simply wish to view again) anytime, on-demand.

Confirmed Online Class Schedule (10 classes, each running 4:00 – 5:00pm, followed by a 15 min Q&A)

JOIN ANYTIME! Students can sign-up and join anytime, including after April 15th. (Recordings will be made for each class and full access provided upon registration)

Class	Date	Unit	Topics
1	Tue, April 14th	B – Forces & Fields	Magnetic Forces, Whatever else
2	Mon, April 20th	C-EMR	30–C1.1k describe, qualitatively, how all accelerating charges produce EMR 30–C1.2k compare and contrast the constituents of the electromagnetic spectrum on the basis of frequency and wavelength 30–C1.3k explain the propagation of EMR in terms of perpendicular electric and magnetic fields that are varying with time and travelling away from their source at the speed of light 30–C1.4k explain, qualitatively, various methods of measuring the speed of EMR 30–C1.5k calculate the speed of EMR, given data from a Michelson-type experiment
3	Tue, April 21st	C - EMR	30–C1.6k describe, quantitatively, the phenomena of reflection and refraction, including total internal reflection 30–C1.7k describe, quantitatively, simple optical systems, consisting of only one component, for both lenses and curved mirrors 30–C1.8k describe, qualitatively, diffraction, interference and polarization
4	Wed, April 22nd		30–C1.9k describe, qualitatively, how the results of Young's double-slit experiment support the wave model of light 30–C1.10k solve double-slit and diffraction grating problems using appropriate formulas 30–C1.11k describe, qualitatively and quantitatively, how refraction supports the wave model of EMR

			30–C1.12k compare and contrast the visible spectra produced by diffraction gratings and triangular prisms.
5	Mon, April 27th	C-EMR	30–C2.1k define the photon as a quantum of EMR and calculate its energy 30–C2.2k classify the regions of the electromagnetic spectrum by photon energy 30–C2.3k describe the photoelectric effect in terms of the intensity and wavelength or frequency of the incident light and surface material 30–C2.4k describe, quantitatively, photoelectric emission, using concepts related to the conservation of energy 30–C2.5k describe the photoelectric effect as a phenomenon that supports the notion of the wave-particle duality of EMR
6	Wed, April 28th	C-EMR	30–C2.6k explain, qualitatively and quantitatively, the Compton effect as another example of wave-particle duality, applying the laws of mechanics and of conservation of momentum and energy to photons. Review of all of Unit C
7	Mon, May 4th	D- Atomic	30–D1.1k describe matter as containing discrete positive and negative charges 30–D1.2k explain how the discovery of cathode rays contributed to the development of atomic models 30–D1.3k explain J. J. Thomson's experiment and the significance of the results for both science and technology 30–D1.4k explain, qualitatively, the significance of the results of Rutherford's scattering experiment, in terms of scientists' understanding of the relative size and mass of the nucleus and the atom. 30–D2.1k explain, qualitatively, how emission of EMR by an accelerating charged particle invalidates the classical model of the atom 30–D2.2k describe that each element has a unique line spectrum 30–D2.3k explain, qualitatively, the characteristics of, and the conditions necessary to produce, continuous line-emission and line-absorption spectra 30–D2.4k explain, qualitatively, the concept of stationary states and how they explain the observed spectra of atoms and molecules
8	Wed, May 6th	D- Atomic	30–D2.5k calculate the energy difference between states, using the law of conservation of energy and the observed characteristics of an emitted photon 30–D2.6k explain, qualitatively, how electron diffraction provides experimental support for the de Broglie hypothesis

			30–D2.7k describe, qualitatively, how the two-slit electron interference experiment shows that quantum systems, like photons and electrons, may be modelled as particles or waves, contrary to intuition.
9	Mon, May 11th	D- Atomic	30–D3.1k describe the nature and properties, including the biological effects, of alpha, beta and gamma radiation 30–D3.2k write nuclear equations, using isotope notation, for alpha, beta-negative and beta-positive decays, including the appropriate neutrino and antineutrino 30–D3.3k perform simple, nonlogarithmic half-life calculations 30–D3.4k use the law of conservation of charge and mass number to predict the particles emitted by a nucleus 30–D3.5k compare and contrast the characteristics of fission and fusion reactions 30–D3.6k relate, qualitatively and quantitatively, the mass defect of the nucleus to the energy released in nuclear reactions, using Einstein's concept of mass-energy equivalence.
10	Wed, May 13th		Final review of concepts as directed by the class.