

Syllabus for ECA Physics (2019)

Instructor: Olayinka A. Akinyemi

July 12, 2019

Textbook: Physics Principles with Applications, Douglas C. Giancoli

Class Times: 2:00 - 2:55pm Monday, Wednesday and Friday.

Room: Hylan 201

Office Hours: 3:00 - 4:00pm Monday, Friday

Homework Policy: Weekly homework must be turned in by the deadline, late submission will be penalized. Extension requests must be made on or before the stipulated deadline.

Academic Honesty Policy: You are encouraged to discuss homework problems with your classmates and to work together, but you must write up your solutions on your own. Direct copying of a classmate's work, or copying from solutions obtained elsewhere, will be regarded as a violation of academic honesty.

Class Attendance Policy - Class Attendance is mandatory and accounts for a sizable percentage of your final grade. Occasionally, you will be asked to pick a partner with whom you are to complete a task while in class. All in-class assignments are to be turned in by the end of class.

Grading Criteria - Attendance - 5%, In-Class Exercises - 10%, Homework - 50%, Final Exam - 35%

Course Content

Lecture 1 - Motion along a straight line, concepts of distance(displacement), speed(velocity) and acceleration, Newton's equations of motion.

Lecture 2- Average and instantaneous quantities of motion, graphical representations of quantities, area under the graphs, slopes of graphs.

Lecture 3- Motion under gravity, worked examples.

Lecture 4 - Vectors and scalars, operations of addition, subtraction and multiplication of vectors, motion in two and three dimensions.

Lecture 5 - Projectile motion and worked examples.

Lecture 6 - Force and motion, Newton's laws of motion, application of Newton's law of motion.

Lecture 7 - Electric charges, quantization of charges, Coulomb's law of electrostatics.

Lecture 8 - Electric Field due to a point charge, electric field due to a electric dipole, electric field due to a line of charge, electric field due to a charged disk.

Lecture 9 - Gauss's Law, charged isolated conductor, Gauss's law for planar, cylindrical and spherical symmetry.

Lecture 10 - Electric potential energy and electric potential, potential due to a point charge, potential due to a continuous

charge distribution, line of charge, charged disk and charged sphere.

Lecture 11 - Current and electricity, current density, resistance, resistivity and conductivity, variation of resistivity with temperature, Ohm's law.

Lecture 12 - Circuits, EMF and internal resistance, resistance in series and in parallel, single and multi-loop circuits, RC and RL circuits.