FOSS Force and Motion Course
Glossary (10/06/04)

acceleration (*a*): Change of velocity per unit of time.

air resistance: The force exerted by air molecules on objects moving through air.

average speed: The theoretical constant speed at which an object would have to travel in order to go a given distance in a given period of time. Total distance divided by total time.

constant speed: Speed that does not vary over time.

data table: A two-dimensional system for recording data that shows correlations between the data entries.

delta (Δ): The fourth letter in the Greek alphabet; the symbol indicates change: final state minus initial state.

displacement (Δ*x*): The amount and direction of change of position between an object's initial position and final position.

distance (*d*): The amount of change of position between an initial position and a final position; always a positive number.

Dotcar: A rolling car that records time and distance data as it moves. Data can be recorded mechanically by making an ink dot on paper at regular intervals or electronically in a microprocessor carried by the car.

electromagnetism: One of the four known forces in the universe.

equation: A mathematical statement showing relationships between quantifiable variables.

final position (x_f): The position of an object at the end of a motion.

force (*F*): An interaction between masses. A push or pull.

friction: A force acting between surfaces in contact. Friction acts to resist

motion.

graph: A two-coordinate system for displaying and analyzing an independent variable *(y).*

gravity (*g*): The force due to gravitational attraction between Earth and other masses.

impulse: An interaction between masses; a force exerted for a period of time: $F \times \Delta t$.

inertia: The property of mass that resists change of motion. Large masses have a lot of inertia.

initial position (x_i): The position of an object at the start of a motion.

interaction: Action between two (or more) objects that affects both objects.

interval: An amount, such as the time or distance between two markers. Standard intervals, like seconds and meters, are used to measure time and distance.

LED: Short for light-emitting diode, an electronic device that makes light using solid-state technology instead of a hot filament.

leg: A segment of a complex motion; a logical part of a trip.

mass (*m*): A measure of the quantity of matter in an object.

microprocessor: An integrated circuit that performs all the functions of a computer.

momentum (*p*): A measure of the motion of an object in terms of its mass and its velocity. The greater the mass and/or velocity, the greater the momentum.

motion: The act of changing position.

net force: The sum of all the forces acting on a mass.

newton (N): The unit used to measure force in the metric system.

Newton's laws of motion: 1. Objects remain in uniform motion (at rest or constant velocity) until acted on by a net force. 2. A net force exerted on an object results in acceleration proportional to the strength of the force and inversely proportional to the mass of the object. 3.   For every action there is an equal and opposite reaction.

photosensor: An electronic device that converts light energy into electricity.

physicist: A scientist who studies matter, energy, force, and motion.

position (x): An object's location at a given time.

rate: A mathematical relationship between two factors, such as the relationship between distance and time in a motion event.

reference point: A specific location used to monitor change of position. Reference points can be on a moving object or in an object's environment.

slope: The angle at which a surface or line is inclined. In graphs, slope is rise (Δy) over run (Δx).

speed (v): The distance traveled by an object in a unit of time. Speed is reported in standard units of distance per unit time, such as meters per second or kilometers per hour.

terminal speed: The maximum speed a particular object can obtain during free fall through air.

theoretical: Based on a mathematically determined or reasoned explanation of some natural phenomenon.

time: The difference between then and now; often quantified in standard intervals such as seconds and hours.

velocity (v): The change in position per unit of time: $\Delta x/\Delta t.$