



Department of Physics
College of Arts and Sciences
American University of Sharjah (AUS)

Topics of the Physics Placement Test

The topics that are covered in the physics placement test usually include the followings:

- **Units conversion of physical quantities.**
- **Basic trigonometry:**
 - Right triangle and the trigonometric ratios $\sin(\theta)$, $\cos(\theta)$ and $\tan(\theta)$,
 - Pythagorean theorem,
 - Applying the Sine and Cosine rules to find unknown sides or unknown angles in a triangle.
- **Dimensional analysis.**
- **Motion in 1-dimension:**
 - Describing motion: the meaning of position, displacement, distance, velocity, speed, and acceleration,
 - Kinematics equations for motion with constant acceleration; and their applications in solving problems,
 - Free fall motion,
 - Pictorial representation of motion: The position versus time and the velocity versus time graphs; and the meaning of slope and area in these graphs.
 - Finding the velocity and acceleration by differentiating the time-dependent functions for the position and velocity, respectively.
- **Vector Algebra: different presentations of vectors including the unit vector notations (i and j), component-analysis of vectors, components addition, and finding the magnitude and direction of the resultant (or net) vector of a group of vectors.**
- **Free-body diagrams and applications of Newton's laws.**
- **Kinetic energy and linear momentum.**
- **Gravitational potential energy.**
- **The law of mechanical energy conservation and its applications.**