**Lecturer name:** Abubaker Ahmed Siddig

**Office No :** 1A 67 (Building 4)

**Office hours:** sunday (two hours: 1-2 p.m and 3-4 p.m), and Tuesday (12-1 p.m)

**The course content (Phys 103):** Dimensions, and units of physical quantities One-dimensional motion with constant acceleration, freely falling objects Introduction to vectors Two dimensional motion, projectiles, uniform circular motion Newton's laws of motion, Forces of friction, applications of Newton's laws Energy and energy transfer: work done by a constant force, work done by a varying force, kinetic energy, gravitational potential energy, elastic potential energy, conservation of energy, power. Linear momentum and collisions: linear momentum and its conservation. Impulse and momentum. Collisions in one dimension. Two-dimensional collisions. Rotation of a rigid object about a fixed axis: angular position, velocity, and acceleration. Rotational kinematics: rotational motion with constant angular acceleration. Rotational kinetic energy. Calculation of moments of inertia. Torque. Relationship between torque and angular acceleration. Work, power, and energy in rotational motion.

**Reference books:**

**English Ref:** Physics for Scientists and Engineers 6th Edition Raymond A. Serway

| Chapter | Title | Section | Hours |
|---|---|---|---|
| 1 | Physics and measurement | 1.1, 1.4, 1.5 | 2 |
| 2 | Motion in One Dimension | 2.1, 2.2, 2.3, 2.5, 2.6 | 4 |
| 3 | Vectors | 3.1--to--3.4 | 3 |
| 4 | Motion in Two Dimensions | 4.1--to--4.5 | 5 |
| 5 | The Laws of Motion | 5.1--to--5.8 | 5 |
| 6 | Circular Motion and Other Applications of Newton's Laws | 6.1 | 2 |
| 7 | Energy and Energy Transfer | 7.2--to--7.8 | 5 |
| 8 | Potential Energy | 8.1--to--8.5 | 5 |
| 9 | Linear Momentum and Collisions | 9.1--to--9.4 | 5 |
| 10 | Rotation of a Rigid Object About a Fixed Axis | 10.1--to--10.8 | 6 |