



<b>Program and Degree: BSc in Aerospace Engineering</b>	
<b>Course Description</b>	
<b>Course Title</b>	<b>Dynamics</b>
<b>Prerequisites</b>	Statics
<b>The course aims</b>	<p>Students' acquaintance with the basics of dynamics and motion of objects and kinematics.</p> <ul style="list-style-type: none"> <li>1- Ability to mathematical modeling of motion of physical objects and rigid body in plane and in space</li> <li>2- Mathematical mmodeling of motion of a group of particles and fluids</li> <li>3- Solving the spatial dynamics and Flight in three-dimensional space</li> </ul>
<b>Contents</b>	<ol style="list-style-type: none"> <li>1. An introduction and to Dynamics, Vectors and Matrices and Newton's Laws</li> <li>2. The dynamics of material particles, includes the kinematics of the material point, the definition of the direct motion of the straight line of the material point, the angular motion of a line, curvilinear motion in the plane, relative motion in the plane, motion in space</li> <li>3. Kinetics of the material point: the equations of motion, work and energy, impact and momentum, motion under the central gravity force, motion in a moving coordinate system</li> <li>4. Dynamics of rigid bodies: kinematics and kinetics of rigid body in the plane, absolute and relative motion, moment of inertia around an axis, work and energy, and impact.</li> <li>5. Kinematics of rigid bodies in space: absolute and relative motions</li> <li>6. Kinetics of rigid bodies in space: angular momentum, properties of mass moment of inertia, angular momentum and Euler equations of motion. gyroscopic motion, energy equations of motion, general motion in space,</li> </ol>
<b>Duration</b>	<b>1 Semester (16 weeks)</b>
<b>Course Hours</b>	<b>4 hours/week</b>
<b>Course Type</b>	<b>Required</b>