



<b>Program and Degree: BSc in Aerospace Engineering</b>	
<b>Course Description</b>	
<b>Course Title</b>	<b>Design of Aerospace structures</b>
<b>Prerequisites</b>	Aircraft structural analysis
<b>The course aims</b>	Students' acquaintance with the principles flying vehicles structures design and sizing.
<b>Contents</b>	<ol style="list-style-type: none"> <li>1- External forces applied to flying vehicles, Load factor, Gust load factor, Load factor vs flight speed diagram.</li> <li>2- Bending stresses, Unsymmetrical bending, K-Method, Neutral axis, bending of curved beams.</li> <li>3- Shear stress in Beams and thin shells, Solid and open sections, Torsion, shear center, Membrane stress, shear flow in closed thin wall sections.</li> <li>4- Structural idealization, Effect of idealization on the analysis of open and closed section beams, Curved web with constant shear flow.</li> <li>5- Structural stability of beams and shells, Different kind of stresses such as Compression, Torsion, Combined loading, buckling stress, crippling stress.</li> </ol> <ol style="list-style-type: none"> <li>1- Strength of simple and combined parts of airframes: Combined Stress, Yield Theory, Ultimate Failure, strength in bending.</li> <li>2- An introduction to stress analysis in aircraft components: Wing analysis based on Modified Beam Theory, Effective width of the skin.</li> <li>3- An Introduction to fuselage design and stress analysis, Effective width of the curved skin, Example problem.</li> <li>4- Materials used in the structure of air vehicles and their specifications.</li> </ol>
<b>Duration</b>	<b>1 Semester (16 weeks)</b>
<b>Course Hours</b>	<b>3 hours/week</b>
<b>Course Type</b>	<b>Optional</b>