

1. **Basic structural elements in aircraft structures**
2. **2D problems in elasticity (review)**
3. **Column and beam-column buckling**
4. **Bending and buckling of plates**
5. **Torsion**
 - 5.1) Prandtl stress function approach / S. Venant displacement field approach
 - 5.2) S. Venant's principle
 - 5.3) Bar having circular cross-section
 - 5.4) Bar having narrow rectangular cross-section
 - 5.5) St. venant's warping function
6. **Bending of thin-walled beams (open and closed)**
 - 6.1) Euler-Bernoulli beam (symmetrical bending)
 - 6.2) Bi-directional bending (unsymmetrical bending)
 - 6.3) Calculation of section properties
 - 6.4) Thin wall assumption
7. **Shear of beams**
 - 7.1) Open and single-cell closed section thin walled beams equilibrium equations
 - 7.2) Shear of open section beams and shear center
 - 7.3) Shear in closed thin-walled sections and location of shear center
8. **Combined open and closed section beams**
 - 8.1) Bending, 8.2) Shear, 8.3) Torsion, 8.4) loads acting on major aircraft components
9. **Structural idealization**
 - 9.1) Panel idealization
 - 9.2) Effect of idealization on open and closed section beams
 - 9.3) Shear of open and closed section beams
 - 9.4) Combined flexural and torsional shear flow in closed thin-walled sections
 - 9.5) Closed multi-cell sections

References

- T.H.G. Megson, Aircraft structures for engineering students, Elsevier
C. T. Sun, Mechanics of aircraft structures, Wiley