



# National University of Sciences and Technology

## Course Description

Course Title	Course Code	Credit Hours
Advanced Mechanics of material	ME 835	3 – 0

### Textbook:

- F P Beer, E R Johnston, J T Dewolf, D E Mazurek, Mechanics of Materials, McGraw-Hill.

### Reference Books:

- P P Benham, R J Crawford, C G Armstrong, Mechanics of Engineering Materials,
- R G Budynas, Advanced Strength and Stress Analysis, 2nded, McGraw Hill

### Course Objective:

- Enhance students' understanding of the behavior of materials under various loading conditions, providing them with advanced analytical tools to evaluate and design robust and innovative structures and components

### Course Outline:

- Review of mechanics of materials, Stress transformations, general 3D stress state, Mohr's circle in 3D, strain transformations, generalized stress-strain relationship, equilibrium and compatibility, introductory topics from theory of elasticity, Airy stress functions, Prandtl's stress functions for torsion, shear flow, torsion of thin-walled tubes, bending of unsymmetrical beams: stress & deflection, transverse shear, composite beams in bending, curved beams, bending of thin flat plates, axisymmetric circular plates in bending, thick-walled cylinders & rotating disks, contact stresses, distributed contact surfaces, contact between curved surfaces. Energy techniques.

### ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%