University of Pretoria Yearbook 2022

Structural mechanics 310 (MSY 310)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	16.00
NQF Level	07
Programmes	BEng (Mechanical Engineering)
	BEng (Mechanical Engineering) ENGAGE
Prerequisites	MOW 227, (WTW 256)
Contact time	1 practical per week, 3 lectures per week
Language of tuition	Module is presented in English
Department	Mechanical and Aeronautical Engineering
Period of presentation	Semester 1

Module content

Introduction of stress tensor. 3D stress and strain transformation. Eigenvalue/vector analysis for principal stresses and strains. Experimental strain measurements. Stress-strain relations. Strain energy. Thin-walled cylinders. Statically indeterminate stress systems. Bending stress, slope and deflection of beams, shear center, non-symmetric beams, composite beams, Castigliano's theorem. Statically indeterminate beams. Buckling instability. Yield criteria. Elementary plasticity. Structural streel design SANS code. Fracture mechanics. Fatigue.