



University of Pretoria Yearbook 2023

Mechanical metallurgy 320 (NMM 320)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	16.00
NQF Level	07
Programmes	BEng (Metallurgical Engineering) BEng (Metallurgical Engineering) ENGAGE
Prerequisites	(NMC 223)
Contact time	3 lectures per week, 3 practicals per week
Language of tuition	Module is presented in English
Department	Materials Science and Metallurgical Engineering
Period of presentation	Semester 2

Module content

Dislocations and deformation (defects in crystalline materials, movement and elastic energy of dislocations, different crystal lattices, origin of and strengthening by dislocations). Strength of engineering materials (tensile testing, plastic deformation of single crystals and polycrystalline materials, hardness, residual stress). Creep deformation (primary and secondary creep, stress and temperature dependence, creep rupture). Introduction to fracture mechanics (Griffith criterion, stress intensity, fracture toughness, fatigue). Failure analysis. Hot and cold rolling of metals.

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