

University of Pretoria Yearbook 2017

Mechanical metallurgy 320 (NMM 320)

Qualification Undergraduate

Faculty [Faculty of Engineering, Built Environment and Information Technology](#)

Module credits 16.00

Programmes [BEng Metallurgical Engineering](#)
[BEng Metallurgical Engineering ENGAGE](#)

Prerequisites (NMC 223)

Contact time 4 practicals per week, 3 lectures per week

Language of tuition Module is presented in English

Academic organisation Materials Science and Metallur

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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