University of Pretoria Yearbook 2016

Process thermodynamics 220 (NPT 220)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	16.00
Programmes	BEng Metallurgical Engineering
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Prerequisites	(CHM 171) or (CHM 172)
Contact time	2 tutorials per week, 4 lectures per week
Language of tuition	English
Academic organisation	Materials Science and Metallur
Period of presentation	Semester 2

Module content

The first, second and third laws of thermodynamics, enthalpy and heat capacity. The criteria for equilibrium, Gibbs free energy, chemical potential, partial molar Gibbs free energy, activity, activity coefficient and the equilibrium constant. Solution thermodynamics of ideal and non-ideal solutions, as well as solution models. Ellingham, Kellogg and Pourbaix diagrams. The thermodynamic principles are applied to metallurgical processes. Applications also include stoichiometry and mass balance problems, as well as the calculation of energy balances.