

University of Pretoria Yearbook 2022

Process thermodynamics 220 (NPT 220)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	16.00
NQF Level	06
Programmes	BEng (Metallurgical Engineering) BEng (Metallurgical Engineering) ENGAGE
Prerequisites	(NTC 210)
Contact time	2 tutorials per week, 4 lectures per week
Language of tuition	Module is presented in English
Department	Materials Science and Metallurgical Engineering
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.

The regulations and rules for the degrees published here are subject to change and may be amended after the publication of this information.

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations.