University of Pretoria Yearbook 2019

Chemical engineering 310 (CIR 310)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	8.00
Programmes	BEng Chemical Engineering
	BEng Chemical Engineering Engage
Prerequisites	(CTD 223), CHM 215
Contact time	2 tutorials per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Chemical Engineering
Period of presentation	Semester 1

Module content

Fundamentals of phase and chemical equilibrium with emphasis on vapour/liquid systems leading to the study of separations and reacting systems. Concepts and formalism of thermodynamics. Postulates and laws of thermodynamics. Thermodynamic functions (enthalpy, entropy, Gibbs free energy). Thermochemistry and Ellingham diagrams. Phase Equilibria: Phase diagrams of single substances, phase boundaries, the Phase Rule. Phase diagrams of mixtures, steam distillation, eutectic mixtures. Solution thermodynamics: Ideal and non-ideal solutions, excess properties and activity coefficient models. The equations of state of ideal and real gases, residual properties and fugacity. Vapour-liquid equilibrium from equations of state and the approach. Application of thermodynamics to equilibrium between fluid- (gas and liquid) and condensed (liquid and solid) phases. Chemical reaction equilibrium.