University of Pretoria Yearbook 2017

Thermoflow 310 (MTV 310)

Qualification	Undergraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	16.00
Programmes	BEng Mechanical Engineering
	BEng Mechanical Engineering ENGAGE
	BEng Metallurgical Engineering
	BEng Metallurgical Engineering ENGAGE
	BEng Mining Engineering
	BEng Mining Engineering
	BEng Mining Engineering ENGAGE
Prerequisites	No prerequisites.
Contact time	3 lectures per week, 1 practical per week
Language of tuition	Module is presented in English
Academic organisation	Mechanical and Aeronautical En
Period of presentation	Semester 1

Module content

Introduction: Liquids and gases, pressure, viscosity, temperature, heat. Introduction to Navier-Stokes and continuity equations. Definitions and properties of fluids, fluid statics, fluid dynamics, Bernoulli equations. Flow measurements. Dimensional analysis: force, drag, Reynolds number, force coefficient, power. Flow in pipes and channels: friction coefficients and Reynolds number, pressure drop; laminar, turbulent and transitional flow. Flow over bodies: drag and lift. Experimental techniques in fluid mechanics. Introduction to basic thermodynamic heat transfer concepts: conduction (steady state and transient heat conduction), extended surfaces, applications.