

University of Pretoria Yearbook 2022

Computational fluid dynamics 411 (MKM 411)

Qualification Undergraduate

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

Module credits 16.00

NQF Level 08

Programmes [BEng \(Mechanical Engineering\)](#)

[BEng \(Mechanical Engineering\) ENGAGE](#)

Prerequisites (MTV 310), (MKM 321)

Contact time 1 practical per week, 3 lectures per week

Language of tuition Module is presented in English

Department Mechanical and Aeronautical Engineering

Period of presentation Semester 1

Module content

A fast review of partial differential equations, introduction to continuum mechanics, continuity equation, momentum equation, Navier- Stokes equation, energy equation, boundary conditions in thermal fluid systems, finite difference method, linear and non-linear partial differential equations, introduction to finite volume method (FVM), FVM for diffusion problems, FVM for convection-diffusion problems, introduction to pressure-velocity coupling in FVM, SIMPLE algorithm, introduction to computational fluid dynamics (CFD) software packages and their abilities, using CFD commercial software packages to solve thermal-fluid engineering problems.

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