

University of Pretoria Yearbook 2022

Optimum design 420 (MOO 420)

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 No prerequisites.

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 2

Module content

Elements of optimisation, optimization problem identification and classification, optimisation formulations for physics-based models, model identification, data-driven models, optimisation background mathematics, loss functions, regularisation, constrained and unconstrained real-parameter optimisation. Optimisation solution philosophies: minimisation, optimality criteria, non-negative gradient projection points. Optimisation algorithms: gradient-based, derivative-free, gradient-only. Compute using a high-level programming language.

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