University of Pretoria Yearbook 2020

Numerical methods and finite element applications for Civil Engineers 790 (SIK 790)

Qualification	Postgraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	24.00
Programmes	BEngHons Geotechnical Engineering
	BEngHons Structural Engineering
	BEngHons Transportation Engineering
	BEngHons Water Resources Engineering
Contact time	40 contact hours
Language of tuition	Module is presented in English
Department	Civil Engineering
Period of presentation	Year

Module content

In the first part of this course, numerical procedures and some underlying theory for solving systems of equations, eigenvalue problems, integration, approximation and boundary value problems will be discussed. The second part of the course covers general finite element theory, discretization aspects related to geometry, nodes and numbering, element type and shape, interpolation functions, formulation of element characteristic matrices and vectors for elasticity problems, assembly and solution of the finite element equations, modelling procedures and results processing. The student will use Finite Element software to apply the theory that was covered in the course for solving typical Civil Engineering problems.