

## University of Pretoria Yearbook 2020

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

<b>Qualification</b>	Postgraduate
<b>Faculty</b>	<a href="#">Faculty of Engineering, Built Environment and Information Technology</a>
<b>Module credits</b>	24.00
<b>Programmes</b>	<a href="#">BEngHons Geotechnical Engineering</a> <a href="#">BEngHons Structural Engineering</a> <a href="#">BEngHons Transportation Engineering</a> <a href="#">BEngHons Water Resources Engineering</a>
<b>Contact time</b>	40 contact hours
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Civil Engineering
<b>Period of presentation</b>	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.

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