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# University of Pretoria Yearbook 2016

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## Finite element applications in Civil Engineering 780 (SIR 780)

<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> <a href="#">BScHons Applied Science Applied Science: Geotechnics</a> <a href="#">BScHons Applied Science Applied Science: Structures</a>
<b>Prerequisites</b>	No prerequisites.
<b>Language of tuition</b>	English
<b>Academic organisation</b>	Civil Eng
<b>Period of presentation</b>	Year

### Module content

A research term paper will be prepared.

This 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. More advanced applications of finite elements such as non-linear static elasticity, buckling, dynamics and transient thermal problems will be covered. In terms of the application of the Finite Element method, the student will choose a specific field (e.g. structures, geotechnical, transportation or water/hydrology) to apply the theory that was covered in the course to solve typical Civil Engineering problems.

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