



# University of Pretoria Yearbook 2022

## Partial differential equations of mathematical physics 776 (WTW 776)

<b>Qualification</b>	Postgraduate
<b>Faculty</b>	<a href="#">Faculty of Natural and Agricultural Sciences</a>
<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Programmes</b>	<a href="#">BScHons (Applied Mathematics)</a> <a href="#">BScHons (Mathematics and Mathematics Education) (Algebra and Analysis)</a> <a href="#">BScHons (Mathematics and Mathematics Education) (Applied Analysis)</a> <a href="#">BScHons (Mathematics and Mathematics Education) (Differential Equations and Modelling)</a> <a href="#">BScHons (Mathematics of Finance)</a> <a href="#">BScHons (Mathematics)</a>
<b>Prerequisites</b>	WTW 710 or WTW 735
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Mathematics and Applied Mathematics
<b>Period of presentation</b>	Semester 2

### Module content

Field-theoretic and material models of mathematical physics. The Friedrichs-Sobolev spaces. Energy methods and Hilbert spaces, weak solutions – existence and uniqueness. Separation of variables, Laplace transform, eigenvalue problems and eigenfunction expansions. The regularity theorems for elliptic forms (without proofs) and their applications. Weak solutions for the heat/diffusion and related equations.

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