

University of Pretoria Yearbook 2021

Hyperbolic systems of partial differential equations 866 (WTW 866)

Qualification	Postgraduate
Faculty	Faculty of Natural and Agricultural Sciences
Module credits	1.00
NQF Level	09
Prerequisites	Partial differential equations at 3rd-year and hons level; Advanced calculus and Linear algebra
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Mathematics and Applied Mathematics
Period of presentation	Semester 1 or Semester 2

Module content

*Consult with the Head of the Department of Mathematics and Applied Mathematics about the availability of this master's module in a particular year.

Systems of first order partial differential equations and their relationship to wave phenomena. The course will show that the traditional wave equation is over-rated as study material. More detailed contents: Hyperbolicity of first order systems (linear and nonlinear); characteristic curves and surfaces; domains of influence and dependence; well-posedness of initial and boundary value problems; shock phenomena; numerical calculation of solutions; application to the equations of compressible gas dynamics and Maxwell's equations for electromagnetism.

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