

# University of Pretoria Yearbook 2023

## Hyperbolic systems of partial differential equations 866 (WTW 866)

<b>Qualification</b>	Postgraduate
<b>Faculty</b>	<a href="#">Faculty of Natural and Agricultural Sciences</a>
<b>Module credits</b>	1.00
<b>NQF Level</b>	09
<b>Prerequisites</b>	Partial differential equations at 3rd-year and hons level; Advanced calculus and Linear algebra
<b>Contact time</b>	1 lecture 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 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.

### Regulations and rules

The regulations and rules for the degrees published here are subject to change and may be amended after the publication of this information.

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these

regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations.

**University of Pretoria Programme Qualification Mix (PQM) verification project**

The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.