

# University of Pretoria Yearbook 2022

## Radiation physics 300 (RPH 300)

<b>Qualification</b>	Undergraduate
<b>Faculty</b>	<a href="#">Faculty of Health Sciences</a>
<b>Module credits</b>	10.00
<b>NQF Level</b>	07
<b>Programmes</b>	<a href="#">BRad in Diagnostics</a>
<b>Prerequisites</b>	RPH 200
<b>Contact time</b>	3 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Physics
<b>Period of presentation</b>	Semester 1

### Module content

**Digital radiography:** data acquisition (equipment, detectors, analogue to digital conversion), image properties, image matrix, bit depth, file formats, data compression. Image processing (filters, frequency, spatial, Fourier transform), contrast adjustment (histogram equalisation, gamma-, linear and logarithmic adjustment), edge enhancement (pixel shifting, subtraction). Image quality (noise, resolution).

**Computed tomography:** technological developments in construction and design. Data acquisition (parameters, field size). Image reconstruction (fundamental equations and algorithms). Image processing (CT number, window width, window height). Image quality (resolution, quantum mottle, spatial uniformity, frequency modulation transfer function).

**Magnetic resonance imaging:** principles (spin angular momentum, torque, precession, magnetic moment, spin orientation, Larmor frequency), acquisition (RF pulses, magnetic field gradient, superconductivity, spin echo sequence, weighted images).

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