



University of Pretoria Yearbook 2022

Radiation physics 300 (RPH 300)

Qualification	Undergraduate
Faculty	Faculty of Health Sciences
Module credits	10.00
NQF Level	07
Programmes	BRad in Diagnostics
Prerequisites	RPH 200
Contact time	3 lectures per week
Language of tuition	Module is presented in English
Department	Physics
Period of presentation	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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