University of Pretoria Yearbook 2018

Radiation physics 310 (RFI 310)

Qualification	Undergraduate
Faculty	Faculty of Natural and Agricultural Sciences
Module credits	10.00
Programmes	BRad Diagnostics
Service modules	Faculty of Health Sciences
Prerequisites	FSG 251, RFI 210, RAW 281, RBG 281, RAN 280, RAW 282, FSG 252, FSG 262, RAW 284 and RFI 211
Contact time	3 lectures per week
Language of tuition	Module is presented in Afrikaans
Department	Physics
Period of presentation	Semester 1

Module content

Computed tomography: CT generations. Equipment: x-ray tube, collimators, detectors. Image reconstruction: fundamental equations, algorithms.
Image properties: field size, image matrix, voxel, pixel, CT number, window width and height. Image quality: spatial resolution, contrast resolution, quantum mottle, spatial uniformity and frequency. Image processing: edge enhancement, pixel shifting and subtraction. Digital radiography: X-ray, equipment, analogue to digital conversion, linear and logarithmic subtraction, image noise. Ultrasound: theory, transducers, piezo-electric crystals, resonant frequency, interaction with matter, acoustic impedance, Doppler techniques. Magnetic resonance: medical applications.