

University of Pretoria Yearbook 2017

Radiation physics 310 (RFI 310)

Qualification Undergraduate

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

Academic organisation 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.

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