

Topics for the didactic/scientific lecture

The position of *Professor*, number 4 in the Staff Register of Department of Physics, Faculty of Science,

1. Fundamental quantities that characterise radiation-matter interactions.
2. Radiobiological properties of the cell and cell cycle.
3. The radiobiology of normal tissue. Serial and parallel organs.
4. The 5 R's of radiobiology and dose fractionation.
5. The bystander effect and the adaptability to radiation.
6. Radiobiological principles of brachytherapy.
7. Models and modelling in radiobiology.
8. The radiobiology of specialised treatments.
9. Natural and man-made sources of radiation.
10. The linear, threshold and hormetic theories of dose-response.
11. The interaction between low LET (linear energy transfer) radiation and tissue.
12. The interaction between high LET (linear energy transfer) radiation and tissue.
13. Dosimetric quantities and units in medical physics.
14. Thermoluminescent dosimetry and applications.
15. Radioprotection from the medical physicist's perspective.

Bibliography

1. G. Steel, *Basic clinical radiobiology*, Hodder Arnold Publishing, 2002
2. E. Hall, *Radiobiology for the radiologist*, 5th edition, Lippincott Williams & Wilkins, 2000
3. M. Knowles & P. Selby, *Introduction to the cellular and molecular biology of cancer*, Oxford University Press, 2006.
4. A. Nias, *An introduction to radiobiology*, 2nd edition, Wiley, 2000.
5. R. Dale & B. Jones, *Radiobiological modelling in radiation oncology*, The British Institute of Radiology, 2007.
6. Metcalfe P, Kron T, Hoban P, *The physics of radiotherapy X-rays from linear accelerators*, Medical Physics Publishing, Madison, Wisconsin, 1997.
7. Johns H, Cunningham J, *The physics of radiology*, 4th edition, Charles Thomas Publisher, 1983.
8. Stabin M, *Radiation protection and dosimetry: an introduction to health physics*, Springer, 2007.
9. Podgorsak E, *Radiation physics for medical physicists*, Springer, 2005.