

Information sheet for the course Biophysics, Radiology and Nuclear Medicine

University: <i>Alexander Dubček University of Trenčín</i>	
Faculty: <i>Faculty of Health Care</i>	
Course unit code: <i>BRNMedc/d</i>	Course unit title: <i>Biophysics, Radiology and Nuclear Medicine</i>
Type of course unit: <i>compulsory</i>	
Planned types, learning activities and teaching methods: <i>Lecture: 1 hour weekly/13 hours per semester of study; full-time</i>	
Number of credits: 3	
Recommended semester: <i>1st semester in the 1st year (full-time)</i>	
Degree of study: <i>I (bachelor)</i>	
Course prerequisites: <i>none</i>	
Assessment methods: <i>Written or oral examination (50 score points) - for obtaining the particular grades it is necessary to achieve:</i> <i>at least 45 score points for the grade A</i> <i>at least 40 score points for the grade B</i> <i>at least 35 score points for the grade C</i> <i>at least 30 score points for the grade D</i> <i>at least 25 score points for the grade E</i>	
Learning outcomes of the course unit: <i>The student will acquire knowledge by studying the subject, objectives and tasks of medical imaging, biophysical principles of methods used in radiology and nuclear medicine. The will acquire basic knowledge of radioactivity, ionizing radiation, protection of patients and staff from the effects of ionizing radiation.</i>	
Course contents: <ol style="list-style-type: none"><i>1. Atom, atomic composition, core, cover, base particles.</i><i>2. Biophysics of cells. Electric speeches of cells. Action potential. Reflex arc.</i><i>3. Radioactivity and ionizing radiation. Establishment. Detection. Effects on living matter.</i><i>4. X-ray, X-ray tubes. Imaging using X-rays. Radiology</i><i>5. Ultrasound. The principles of ultrasound investigation. Ultrasonic devices.</i><i>6. Basic principles of Magnetic Resonance Imaging.</i><i>7. Biocybernetics. Cybernetic systems, principles of modeling, theory and information management control. Biological principles of some therapeutic methods in medicine.</i><i>8. Biophysical principles of some medical imaging methods.</i><i>9. Contrast agents udes in radiology. Side effects. First aid for anaphylactic shock.</i><i>10. Principles of diagnostic imaging methods according to organ systems.</i><i>11. Diagnostics of diseases of the chest organs, blood vessels and heart.</i><i>12. Diagnostics of diseases of the breast and soft tissue.</i><i>13. Diagnostics of CNS, skeleton and GIT.</i>	
Recommended of required reading: <ol style="list-style-type: none"><i>1. NAVRÁTIL, L. – ROSINA, J.: Lékařská biofyzika. Praha : MANUS, 2009. 349 p. ISBN 80-902318-5-3.</i><i>2. HRAZDÍRA, I. - MORNSTEIN V.: Úvod do obecné a lékařské biofyziky. Brno : MU 1998. ISBN 80-210-1822-4.</i><i>3. SLOBODNÍKOVÁ, J. – FURDOVÁ, A. – KRÁLIK, G. – ŠRAMKA, M.: Moderné zobrazovacie, diagnostické a liečebné metódy. Bratislava : VŠZaSP sv. Alžbety, 2012. 144 p.</i>	

ISBN 978-80-89464-18-8.

4. ŠAJTER, V. a kol.: *Biofyzika, biochémia a rádiológia*. Martin : Osveta, 2006. 272 p. ISBN 80-8063-210-3.

5. ŠEVČÍKOVÁ, L. a kol.: *Vybrané kapitoly z lekárskej biofyziky, rádiológie, rádiodiagnostiky a rádioterapie v onkológii*. Bratislava : SZU, 2004. 79 p.

Language: *Slovak*

Remarks:

Evaluation history: *Number of evaluated students -*

A	B	C	D	E	FX

Lectures: doc. MUDr. Jana Slobodníková, CSc.

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Supervisor: doc. MUDr. Mária Štefkovičová, PhD., MPH