COLLEGE OF PROFESSIONAL STUDIES - INTERNATIONAL CENTER OF PROFESSIONAL STUDIES
(hereinafter: **ICEPS**)

Study program:

Undergraduate professional studies

RADIOLOGY

~ COURSE BOOK ~

Courses by semesters and years of study program Nursing, undergraduate professional studies

- **Marks for Form of Teaching**: **theor lect** = theoretical lectures; **exer** = theoretical exercises; **other** = other forms of teaching (individual work with students, project work...); **st-res pap** = study-research paper (Degree Paper...); **prof pract** = professional (clinical) practice (in the School's Teaching Bases)
- **Marks for Mandatory/Elective courses**: **m** = mandatory course; **e** = elective course
- **Marks for Type of Courses**: **ag** = academic-general education; p = professional; pa = professional-applicative

No	Course Code	Course Name	Sem.	Active Lessons				Prof pract	ECTS	Course m/e	Course Type
				theor lect	theor exer	other forms	st-res pap				
THE FIRST YEAR											
1	rad-01	Anatomy and Physiology	1	45	15	0	0	0	7	m	pa
2	rad-02	Basics of Nursing	1	30	15	0	0	300	8	m	p
3	rad-07	Basics of Information and Communication Technologies	1	30	30	0	0	0	5	m	p
4	rad-05	Radiology Physics and Basics of Radiology Work Methods	1	15	60	0	0	0	5	m	pa
5	rad-izb-01	Elective Course 1	1	30	30	0	0	0	5	e	
5a	rad-izb-01-d	Business Communication Skills	1	30	30	0	0	0	5	e	pa
5b	rad-izb-01-b	Ethics in Health Care	1	30	30	0	0	0	5	e	ag
5c	rad-izb-01-a	Geriatrics with Nursing in Geriatrics	1	30	30	0	0	0	5	e	pa
5d	rad-izb-01-v	Specialized English for Medicine 1	1	30	30	0	0	0	5	e	ag
5e	rad-izb-01-g	Specialized German for Medicine 1	1	30	30	0	0	0	5	e	ag
6	rad-04	Hygiene with the Basics of Microbiology	2	30	30	0	0	330	5	m	p
7	rad-06	Roentgen Anatomy and Radiographic Techniques	2	45	60	0	0	300	12	m	p
8	rad-03	Radiation Protection	2	45	30	0	0	0	8	m	ag
9	rad-izb-02	Elective Course 2	2	30	30	0	0	0	5	m	
9a	rad-izb-02-a	Marketing of Health Care Institutions	2	30	30	0	0	0	5	e	p
9b	rad-izb-02-b	Public Health	2	30	30	0	0	0	5	e	p
9c	rad-izb-02-v	Organization of Health Care Systems	2	30	30	0	0	0	5	e	ag
Total number of classes and ECTS per year:				**300**	**300**	**0**		**930**	**60**		
THE SECOND YEAR											
10	rad-13	Pathophysiology	3	45	30	0	0	0	6	m	p
11	rad-14	Radiation Producing (Roentgen) Apparatus and Devices	3	30	75	0	0	240	8	m	pa
12	rad-10	Basics of Internal medicine	3	45	15	0	0	0	5	m	pa
13	rad-15	First Aid	3	30	30	0	0	0	5	m	pa
14	rad-izb-03	Elective Course 3	3	30	30	0	0	0	5	m	
14a	rad-izb-03-v	Specialized English for Medicine 2	3	30	30	0	0	0	5	e	ag
14b	rad-izb-03-g	Specialized German for Medicine 2	3	30	30	0	0	0	5	e	ag
15	rad-11	Basics of Radiotherapy	4	30	30	0	0	240	8	m	pa
16	rad-12	Basics of Ultrasound Diagnostics	4	30	45	0	0	300	9	m	pa
17	rad-09	Organization of Radiology Ward	4	30	15	0	0	0	4	m	ag
18	rad-08	Pharmacology and Drug Dosing	4	30	30	0	0	0	5	m	pa
19	rad-izb-04	Elective Course 4	4	30	30	0	0	0	5	m	
19a	rad-izb-04-a	Human Resources Management in Health Care	4	30	30	0	0	0	5	e	pa
19b	rad-izb-04-d	Allergology	4	30	30	0	0	0	5	e	p
19c	rad-izb-04-đ	Rare Diseases	4	30	30	0	0	0	5	e	p
Total number of classes and ECTS per year:				**330**	**330**	**0**		**780**	**60**		
THE THIRD YEAR											
20	rad-20	Basics of Surgery with Orthopedics	5	30	15	0	0	0	5	m	pa

21	rad-17	Emergency Medicine and Nursing in Special Conditions	5	30	30	0	0	240	6	m	pa
22	rad-18	Diagnostic Radiology	5	60	75	0	0	300	10	m	pa
23	rad-izb-05	Elective Course 5	5	30	30	0	0	0	5	m	
23a	rad-izb-05-a	Mental Hygiene	5	30	30	0	0	0	5	e	pa
23b	rad-izb-05-b	Basics of Oncology with Selected Sections from Radiotherapy and Nursing of Oncological Patients	5	30	30	0	0	0	5	e	pa
23c	rad-izb-05-v	Business English	5	30	30	0	0	0	5	e	ag
23d	rad-izb-05-g	Business German	5	30	30	0	0	0	5	e	ag
24	rad-16	Interventional Vascular and Non-vascular Methods	6	60	60	0	0	270	10	m	pa
25	rad-19	Modern Diagnostic Radiology Methods	6	60	60	0	0	300	9	m	pa
26	rad-izb-06	Elective Course 6	6	30	30	0	0	0	5	m	
26a	rad-izb-06-v	Research Methodology	6	30	30	0	0	0	5	e	p
26b	rad-izb-06-a	Quality Control	6	30	30	0	0	0	5	e	p
26c	rad-izb-06-b	Health Care and Social-Security Legislation	6	30	30	0	0	0	5	e	ag
27	rad-22	Degree Paper	6	0	0	0	300	0	10	m	p
Total number of classes and ECTS per year:				**300**	**300**	**300**		**1.110**	**60**		

Total number of classes and ECTS per all three years of studies:				**2.160**				**2.820**	**180**		

ALLERGOLOGY

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Allergology**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	second year, fourth semester
ECTS:	5
Requirement:	no

Course objective:
The objective of the course is to familiarize students with and their understanding of the basic principles of allergology, their capability to use specialist literature relating to this field and to state their opinion in the field of allergology.

Course outcome:
The outcome of the course is the acquisition of fundamental knowlede in allergology, familiarizaiton with the basics of diagnostics in allergology and capability of students of taking measures in the prevention of allergic reactions or their elimination. The outcome of the course is also familiarization of students with basic pathological cases in the field of allergology and their capability to use specialist literature relating to this field.

Course content:
Lectures
Objects, definition and tasks of allergology; respiratory allergy (rhinitis, rhinoconjuctivitis, asthma); drug allergy; poison allergy (wasps, bees); allergic contact dermatitis; food allergy; latex allergy; hives (urticaria); plant allergy; pollen allergy; anaphylaxis; application of allergy elimination techniques; skin testing for allergy; provocation test; desensitization; allergen specific immunotherapy.
Exercises
Types of allergies – case studies; applications of allergy elimination techniques – case studies; analysis of most frequent allergic reactions in Serbia; first aid measures, nursing in case of allergic reactions; searching e-literature and presentation of certain less known allergic reactions; renowned health-care andscientific institutions in Serbia in the field of allergology.

Literature:
Literature in English:
1. Wesley Burks A., Holgate S. T., O'Hehir R. E., Broide D. H., Bacharier L. B.: Middleton's allergy: principles and practice, Elsevier, Amserdam, 2020.
Literature in Serbian:
2. Ljajević J., Ljajević M., Dimčić Radovanović Z.: Alergologija i klinička imunologija u Srbiji, Evropski centar za mir i razvoj, Beograd, 2005.
3. Ramić Z., Pravica V., Popadić D.: Priručnik za nastavu iz imunologije, Medicinski fakultet, Beograd, 2020.
4. Dadarno P. Dž., Vitni K.: Alergije, Sezam book, Beograd, 2020.

Number of classes:

Theoretical lectures	**Theoretical exercises**	**Professional practice**	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures and practical exercises with anatomical and hystological devices, use of atlas, video projections, computer animations and simulations of physiological processes

Grading (maximum 100 points)

Pre-Exam commitments	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	30		
Colloquiums	30		

ANATOMY AND PHYSIOLOGY

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Anatomy and Physiology**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	first year, first semester
ECTS:	7
Requirement:	segment Anatomy is a condition for segment Physiology

Course objective:

Acquisition of knowledge on organ and human body system morphology; familiarity with and understanding normal anatomical and histological structures and notions; acquisition of knowledge in area of cell, tissue, organ system and human organism physiology aimed at understanding the changed, pathological functioning and treatment possibilities; knowledge of and understanding the role of organ control mechanisms, as well as understanding connection between regulatory systems in human organism; provision of theoretical basis required for learning other courses.

Course outcome:

Capability of defining, describing, integrating and reproducing notions relating to normal anatomical and histological structures; upon the completion of the course and passing the exam students will have a command of the corresponding part of medical nomenclature, be able to explain functioning of individual organs and organ systems, will be familiar with and will understand integrated functions of individual organs and the role of organism control mechanisms and they will know and understand the connection of the regulatory system of human organism enabling its adaptation to changes in internal and external environment under everyday conditions.

Course content:

Lectures

Anatomy: Basic anatomical terminology; body areas and parts; upper extremities; bones, joints, muscles, blood vessels and nerves; lower extremities; bones, ankles, muscles, blood vessels and nerves; rib cage; walls, division and content of the thoracic cavity; lungs and pulmonary pleurae; heart; mediastinum organs; abdomen; walls, division and content of abdominal cavity; peritoneum, peritoneal cavity (liver, stomach, spleen, pancreas, small intestine and large intestine); retroperitoneal space (kidney, adrenal gland, aorta, inferior vena cava, celiac plexus); pelvis; wall and content; urinary bladder, rectum, male and female reproductive system, pelvic diaphragm; head and neck; head and facial bones; head and neck muscles; head and neck large blood vessels and nerves; central nervous system.

Physiology: Human physiology study; transport through cell membrane; intercellular communication; explicitation physiology; membrane potential of inactivity; action potential; nervous impulse transmission; skeletal muscle physiology; neuro muscular sinapse; morphophysiological characteristics of skeletal muscles; smooth muscle physiology; characteristics of smooth muscle tissue structure, types, innervation, electrical activity of smooth muscles, specific features of contraction; central nervous system organization, nerve cell; hematoencephalic barrier, cerebrospinal fluid, composition and function; spinal cord; medulla oblongata; midbrain; functional characteristics; reticulo-cortical relations, decerebration rigidity and skeletal muscle tone; cerebellum, structure and function; diencephalon, hypothalamus, vegetative nervous system; basal ganglia; cerebral cortex; senses; definition, importance and general principles of sensory systems; sense of hearing and balance; sense of taste and smell; eyesight; pain perception; introductory notes in pathophysiology.

Exercises

Demonstration of all teaching units on anatomical dummies. Use of atlas; video presentations. Membrane potentials and synaptic transmission. Patellar reflex and pupillary reflex. Impact of different factors on muscular contraction. Haemoglobin, erythrocyte and leukocyte concentration in human blood. Plasm buffer solution capacity. Coagulation. Discussion and analysis of selected physiological systems.

Literature:

Literature in Serbian:

1. Stojšić-Džunja Lj.: Anatomija za studente zdravstvene nege, udžbenik, Medicinski fakultet, Novi Sad, 2017.
2. Veličković D.: Fiziologija za studente farmacije, udžbenik, Medicinski fakultet, Niš, 2013.
3. Despopoulos A., Silbernagl S.: Fiziološki atlas u boji za studente medicine, Medicinski fakultet, Niš, 2007.
4. Mačvanin Đorđe: Anatomija, udžbenik, Fakultet za menadžment u sportu, Alfa univerzitet, Beograd, Matica srpska, Novi Sad, 2005.
5. Milisavljević M. i sar.: Klinička anatomija, udžbenik, Nauka, Beograd, 2004.
6. Guyton A.C., Hall J. E.: Medicinska fiziologija, 11. izdanje, Savremena administracija, Beograd, 2006.
7. Mujović i sar.: Medicinska fiziologija, udžbenik, Medicinski fakultet, Kosovska Mitrovica (Priština), 2008.

Literature in English:

8. Scanlon V., Sanders T.: Essentials of Anatomy and Physiology, Kindle Edition, London, 2018
9. Netter F. H., Machado C. A. G.: Atlas of Human Anatomy & CD, ILS, Mala velika knjiga, Novi Sad, 2005.
10. Drake L. R., Wayne Vogl A., Mitchell A. W. M., et al.: Gray's Anatomy for Students, textbook, Elsevier, New York, 2014.
11. Arroyo J. P.: Back to Basics in Physiology, textbook, Academic Press, London, 2013.

Number of classes:				
Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
45	15	0	0	0
Methods of teaching: lectures and practical exercises with anatomical and hystological devices, use of atlas, video projections, computer animations and simulations of physiological processes				
Grading (maximum 100 points)				
Pre-Exam commitments		**Points**	**Final Exam**	**Points**
Lecture attendance		3	Exam	20 (Anatomy) +20 (Physiology)
Activity		7		
Projects/Seminars		0		
Exercises/professional practice		10 (Anatomy) 10 (Physiology)		
Colloquiums		15 (Anatomy) 15 (Physiology)		

BASICS OF INFORMATION AND COMMUNICATION TECHNOLOGIES

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Basics of Information and Communication Technologies**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	first year, first semester
ECTS:	5
Requirement:	no

Course objective:
Course objective is to enable students to acquire basic knowledge in the area of application of information-communication technologies in health care institutions, familiarizing with text processing software tools and with tabular calculations computer programs.

Course outcome:
Upon passing the exam students will be able to apply the acquired knowledge on computer hardware, peripheral units, software tools, multimedia and the internet in real-life situations in health care institutions, or to use the acquired knowledge to improve the current work in health care institutions. In addition to that, application of calculation or text processing program is important for everyday work of health care professionals.

Course content:
Lectures
Organization of information technology service in health care institution; types of information systems; information systems within health care system; acquisition and acceptance of new information systems in health care, need for continuous updating; work of health care worker within IT system; professional equipment; basics of system analysis; system functioning testing; standards of information technologies system in health care; patient recording; importance of permanent and timely entry of data into system; connection of the system with other national systems, unique system of patient tracking; trends of connecting health care institutions system with pharmaceutical systems; patient data protection; the Internet, internet address, internet access, internet protocols, HTML, World Wide Web, internet services; Windows; specific program used in pharmacy practice; basic program languages used by health care professionals (Word, Excell, Power Point); security systems in health care institutions, panic keys.
Exercises
Types of information systems. Work of health care worker within IT system. Need for continuous updating. Basics of telecommunications and forms of telecommunication systems. Patient recording. Importance of permanent and timely entry of data into system. Work in patient recording program. Use of internet. Basic program languages in the work of health care professional (Word, Excel, Power Point), work in programs. Data processing, surveys. Graphic presentation and tabulating. Types of errors at data processing. Use of security system in health care institution.

Literature:
Literature in Serbian:

1. Marčićević Ž., Marošan Z.: Primena informacionih tehnologija, udžbenik, Visoka poslovna škola strukovnih studija, Novi Sad, 2010.
2. Marošan Z., Vesin B.: Primena informacionih tehnologija, praktikum, Visoka poslovna škola strukovnih studija, Novi Sad, 2009.
3. Gerlič I.: Savremene informacione tehnologije u obrazovanju, udžbenik, Nacionalna izdavačka kuća Slovenija, Ljubljana, 2000.
4. Softver HELIANT za rad u zdravstvenoj ustanovi, demo verzija.
5. Bunzel T.: Microsoft Office 2010 Kao od šale, CET, Beograd, 2010.
6. Tasić M., Ćirić M.: Osnovi informatike, udžbenik, Prirodno-matematički fakultet, Niš, 2002.
7. Milošević Z., Bogdanović D.: Statistika i informatika u oblasti medicinskih istraživanja, udžbenik, Medicinski fakultet Univerziteta u Nišu, Niš, 2012.

Literature in English:
8. Biheller B. R., Evans J., Pinard T. K., Romer M. R.: Microsoft Office 2007: Introductory Course, textbook, Course Technology, Boston, 2007.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, parctical classes, work with software, exercises.

Grading (maximum 100 points)

Pre-Exam obligations	Points	Final Exam	Points
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	30		
Colloquiums	30		

BASICS OF INTERNAL MEDICINE

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Basics of Internal Medicine**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	second year, third semester
ECTS:	5
Requirement:	Basics of Nursing

Course objective:

Adoption of current theoretical and practical specialist knowledge in internal medicine, nursing of internal-medicine patients and training in application of acquired knowledge in health care professional work.

Course outcome:

Upon the completion of the course students are trained to recognize in individual and team work cardiovascular, pulmonary, nephrology, endocrinology, gastroenterology, hematology and oncology conditions.

Course content:

Lectures

Cardiology; specific features of nursing in heart rhythm, pacemaker implantation and electrophysiology ward; diagnostics, therapy and prevention of artery hypertension; specific features of nursing in cardiology wards; prevention, diagnostics and treatment coronary disease risk factors; diagnostics and treatment of acute coronary syndrome; most frequent and most important pulmonary diseases, diagnostics, prevention and treatment; specific features of nursing in pulmonary wards; most frequent and most important internal oncology diseases, diagnostics, prevention and treatment; specific features of administration of cytostatic therapy and chemotherapy in internal patients; most frequent and most important hematologic diseases, diagnostics, prevention and treatment; specific features of nursing in hematology wards; nursing and care of patients with hemorrhagic syndrome; nursing and care of immunocompromised patients; most frequent and most important gastrointestinal and biliopancreatic diseases, diagnostics, prevention and treatment; most frequent and most important liver diseases; endocrinology; most frequent and most important endocrinology diseases, diagnostics, prevention and treatment; specific features of nursing in endocrinology wards; insulin therapy regimes; diabetic foot nursing; most frequent and most important nephrology diseases, diagnostics, prevention and treatment; most frequent and most important immunology diseases, diagnostics, prevention and treatment; specific features of nursing in nephrology and immunology wards; specific features of nursing in dialysis wards; conducting peritoneal dialysis.

Exercisess

Etiology and pathogenesis of cardiovascular diseases. Specific features of nursing in cardiology wards. Prevention, diagnostics and treatment of coronary disease risk factors. Diagnostics and treatment of acute coronary syndrome. Etiology and pathogenesis of pulmonary diseases. Function and general symptomatology of respiratory system diseases. Diagnostics of respiratory system diseases. Anamnesis, physical examination, abdomen inspection, additional examinations of digestive organs. Etiology and pathogenesis of digestive system organs diseases. Functional and general symptoms of digestive system organs. Functional and general symptoms of liver, gallbladder and biliary tract and pancreas diseases. Specific features of nursing in gastrointestinal wards. Preparation of patient for endoscopy diagnostic procedures. Examination and clinical testing of renal disease patient. Specific features of nursing in nephrology and immunology wards. Specific features of nursing in dialysis wards. Conducting hemodialysis and peritoneal dialysis. Propaedeutics of blood and blood forming organs. Specific features of nursing in hematology wards. Nursing and care of patients with hemorrhagic syndrome. Nursing and care of immunocompromised patients. Most frequent and most important endocrinology diseases, diagnostics, prevention and treatment. Specific features of nursing in endocrinology wards. Insulin therapy regimes. Specific features of nursing of patients with locomotor system diseases.

Literature:

Literature in Serbian:

1. Kopitović I.: Interna medicina za studente zdravstvene nege, udžbenik, Medicinski fakultet, Novi Sad, 2015.
2. Manojlović D. i dr.: Interna medicina I, II udžbenik, Zavod za udžbenike i nastavna sredstva, Beograd, 2003.
3. Antić S., Ilić S., Interna medicina, udžbenik, Medicinski fakultet, Niš, 2009.
4. Đurica S.: Interna medicina, udžbenik, Viša medicinska škola, Beograd, 2000.
5. Manojlović S.: Hitna stanja u internoj medicini, udžbenik, Zavod za udžbenike, Beograd, 2011.

Literature in English:

6. Farr C. B.: Internal Medicine for Nurses: Outlines of Internal Medicine for the Use of Nurses, Scholar's Choice, London, 2015.
7. Kasper D., Fauci A., Hauser S., Longo D.: Harrison's Principles of Internal Medicine, textbook, McGraw-Hill Professional, New York, 2015

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with

				student, projects…)
45	15	0	0	0
Methods of teaching: lectures against use of different video materia, exercises on dummy, exercises				
Grading (maximum 100 points)				
Pre-Exam obligations		**Points**	**Final Exam**	**Points**
Lecture attendance		3	Exam	30
Activity		7		
Projects/Seminars		0		
Exercises/professional practice		30		
Colloquiums		30		

BASICS OF NURSING

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Basics of Nursing**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	first year, first semester
ECTS:	8
Requirement:	no

Course objective:
Adoption of basic notions in nursing and basic theoretical and practical (resourcefulness) specialist knowledge in nursing, and training in application of the acquired knowledge in professional and research work. Self-education aimed at own protection, protection of patients and other team members, development of critical thinking, independence in nursing and team work abilities.

Course outcome:
Adoption of a holistic approach in nursing; skills, development of professional awareness, responsibility, humanity, sense of deontology, aesthetics and communication with patients and professional team; student independence in nursing, mastered nurse intervention and interdependent nurse intervention in the field of diagnostics and therapy.

Course content:
Lectures
Theoretical consideration of basic and general notions in medicine; development of nursing; nursing and society; requirements for quality nursing in hospital and out-of-hospital circumstances; nurse interventions at patient hospitalization; nursing process; data gathering and assessment of needs of patients for nursing; general (universal) problems in nursing; nursing of specific groups; nursing documentation; models (methods) of organization of provision of nursing; progressive nursing and patient categorization; improvement of nursing through research work of nurses.
Exercises
Analysis of basic values of nursing and necessary requirements for quality nursing in hospital and out-of-hospital conditions. Basics of good practice and infection control. Nurse interventions at patient hospitalization. Determining needs in nursing. Application of aids to data collecting. Recording vital signs and other health indicators as a form of observing in nursing. Nurse diagnosis and collaboration issue in nursing process. Nursing planning. Nursing plan realization. Practicing certain nurse interventions. Evaluation in nursing process and nurse documentation keeping.

Literature:
Literature in Serbian:

1. Rajak S., Imbronjev V.: Osnovi zdravstvene nege, udžbenik, Omega MS Pharmacy, Novi Sad, 2018.
2. Kekuš D.: Zdravstvena nega u primarnoj zdravstvenoj zaštiti, Visoka zdravstvena škola, Beograd, 2015.
3. Rudić R., Kocev N., Munćan B.: Proces zdravstvne nege, Praktikum, Knjiga-komerc, Beograd, 2005.
4. Tijanić M., Đuranović D., Rudić R., Milović Lj.: Zdravstvena nega i savremeno sestrinstvo, udžbenik, Naučna KMD, Beograd, 2010.
5. Munćan B.: Zdravstvena nega, udžbenik, Beograd, 2014.
6. Babić L.: Zdravstvena nega u radiologiji, udžbenik, Licej, Beograd, 2011.

Literature in English:

7. Springhouse: Nursing procedures, prevod, Data Status, Beograd, 2010.
8. Gulanick M., Myers J. L.: Nursing Care Plans-Nursing Diagnoses and Intervention, Elsevier, Mosby, New York, 2007.
9. Potter P. A., Perry A. G., Stockert P. A., Hall A.: Fundamentals of Nursing, textbook, Elsevier, New York, 2020.
10. Lynn P. B.: Taylor's Clinical Nursing Skills, A Nursing Process Approach, textbook, LWW, Liverpool, 2018.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	15	300	0	0

Methods of teaching:
lectures against use of different video materials, exercises on dummy, simulation, exercises, case study, discussion, workshop.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums	20		

BASICS OF ONCOLOGY WITH SELECTED SECTIONS FROM RADIOTHERAPY AND NURSING OF ONCOLOGICAL PATIENTS

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Basics of Oncology with Selected Sections from Radiotherapy and Nursing of Oncological Patients**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	third year, fifth semester
ECTS:	5
Requirement:	no

Course objective:

Course objective is familiarization of students with origin and occurrence of malignant cell, manner of malignant tumor spreading, their epidemiology and etiology, possibilities of early detection of malignant tumor and premalignant lesions, diagnostics and histological confirmation of malignant tumors. It is necessary to familiarize students with team work in planning oncology treatement, types of treatment and, which is very important, with recognition of complications appearing in the course of treatment of patients with malignant tumors.

Course outcome:

The purpose of the course is to familiarize students with the difficulties oncology patients have prior to and in the course of diagnostic procedure, in the course of treatment and after it, to understand the basic prevention of malignant tumors and recognition of the procedure of early discovery of malignant tumors. In addition to that, upon the completion of the course and after passing the exam, students should know the types and forms of oncology treatment in order to understand dilemmas and problems of the patients, which is all aimed at improvement of the quality of life of patients. It is important for them to recognize at the moment of difficulties those conditions in which it is possible to intervene professionally. Students also study basic principles of pain therapy, psycho-oncological aspect of patients and their families, and they are taught to understand the early and late rehabilitation of oncology patients. Having completed the course, students are familiar with new scientific-technical achievement in the field of diagnostics and treatment of oncology patients, and the application of information systems in oncology.

Course content:

Lectures

Origin and biology of malignant cell; carcinogenesis; genetic predisposition; epidemiology and etiology of malignant tumors; early detection of malignant tumor; carcinoma diagnosis and pathology; determining the stage of the condition and principles of treatment; emergency conditions in oncology; complications in oncology treatment; paraneoplastic syndrome and stress in oncology, oncology rehabilitation; informatics in oncology.

Exercises

Origin and biology of malignant cell. Carcinogenesis. Genetic predisposition. Epidemiology and etiology of malignant tumors. Early detection of malignant tumor. Carcinoma diagnosis and pathology. Determining the stage of cancer and principles of treatment. Surgical principles of treatment. Basic principles of radiotherapy. Basic principles of systemic treatment. Emergency conditions in oncology. Complications in oncology treatment. Paraneoplastic syndrome and stress in oncology. Oncology rehabilitation. Informatics in oncology.

Literature:

Literature in Serbian:

1. Kostić-Milosavljević M.: Onkologija, Visoka zdravstvena škola strukovnih studija, Beograd, 2015.
2. Bošković S.: Zdravstvena nega u onkologiji, Visoka zdravstvena škola strukovnih studija, Beograd, 2012.
3. Jovanović D. (ur.): Osnovi onkologije i palijativna nega, udžbenik, Medicinski fakultet, Novi Sad, 2008.
4. Vrdoljak E. i sar.: Klinička onkologija, Medicinska naklada, Zagreb, 2013.

Literature in English:

5. Watson W., Lucas C., Hoy A., Wells J.: Oxford handbook of Palliative Care, Oxford University Press, Oxford, 2005
6. DeVita T. V.: Cancer Principles and Practice of Oncology, textbook, Lippincott, New Jersey, 2010
7. Itano J. K., Brant J., Conde F., Saria M. (ed.): Core Curriculum for Oncology Nursing, textbook, Saunders, New York, 2015

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	240	0	0

Methods of teaching:

lectures, exercises, case study, e-learning, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40

Activity	7		
Projects/Seminars	0		
Exercises/ professional practic	20		
Colloquiums	30		

BASICS OF RADIOTHERAPY

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Basics of Radiotherapy**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	second year, fourth semester
ECTS:	8
Requirement:	Roentgen anatomy and Radiographic techniques

Course objective:
Familiarization of students with basics of radiotherapy and radiation oncology, as well as with biological and technical principles of radiotherapy in diagnostics and treatment of certain conditions.

Course outcome:
Upon the completion of the course students will acquire knowledge in physical, radiobiological, clinical and technological fundamentals of application of radiotherapy in the treatment of primarily malignant diseases. Students will be able to understand and evaluate factors that affect the application of radiotherapy, recognize and understand radiation dosing, as well as to understand the aims and techniques of conducting radiotherapy treatments. Students will be familiar with possibilities and characteristics of combining radiotherapy with other types of treatment in oncology, possible complication in radiotherapy treatments and radiotherapy quality control procedures.

Course content:
Lectures:
Radiotherapy as a medical discipline; Interaction of ionizing radiation and matter; Mechanism of ionizing radiation effect on biological systems. Radiosensitivity and radiocurability of tumors; Indications for therapy application – factors that affect application of radiotherapy; Radiation dose and fractioning; the“4P“ in radiotherapy; Radiotherapy classification according to targets; Radiotherapy classification according to sources and radiation energy; Radiotherapy equipment; Transcutaneous radiotherapy techniques; brachytherapy; Combining radiotherapy with other types of oncological treatments; Complications in radiotherapy treatment; Dosimetry procedures and quality control (QA) procedures in radiotherapy.
Exercises:
Exercises are compatible with theoretical classes and imply practice and demnostrations in the teaching base. Regulation on personal protection and protection of patients. Radiotherapy environment, radiotherapy bunker. Positioning and immobilization of patient in transcutaneous radiotherapy – demonstration and procedure documenting. Conventional simulator and CT simulator – demonstration and simulation procedure documenting. Radiotherapy planning. Linear accelerator, method of operation, therapy documenting, transcutaneous radiotherapy. Brachytherapy device, method of operation, radiation file, brachytherapy planning, procedure documenting. Checking preciseness of transcutaneous radiation, verification. Demonstration of carrying out dosimetric procedures and radiotherapy quality control procedures. Radiotherapy information system.

Literature:
Literature in Serbian:
1. Lazić J., Šobić V. i sar.: Radiologija, udžbenik, Medicinska knjiga, 2002.
2. Mileusnić D., Durbaba M.: Radijaciona onkologija, udžbenik, Altanova, Beograd, 2012.
3. Stanković J.: Osnovi radiološke fizike u radioterapiji, udžbenik, Fakultet za fizičku hemiju, Univerzitet u Beogradu, 1997.
Literature in English:
4. Kenneth L. B., Lampignano J.: Bontrager's Handbook of Radiographic Positioning and Techniques, Mosby Elseiver, St. Louis, 2013.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	240	0	0

Methods of teaching:
lectures, exercises, video presentations, workshops, case analyses, demonstrations, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums/exam	20		

BASICS OF SURGERY WITH ORTHOPEDICS

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Basics of Surgery with Orthopedics**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	third year, fifth semester
ECTS:	5
Requirement:	Basics of Nursing

Course objective:
Acquisition of theoretical knowledge and skills in nursing patients in all surgery branches.

Course outcome:
Students are tranined to practically apply the acquired knowledge in all surgical disciplines necessary for acquisition of skills in taking care of surgical patients from an aspect of nursing.

Course content:
Lectures
Principles of asepsis and antisepsis; therapy of digestive and endocrine system diseases; therapy of locomotor and endocrine system organ diseases and injuries; therapy of blood and lymph vessel diseases and injuries; therapy of central and peripheral nervous system diseases and injuries; therapy of skin diseases and injuries, principles of reconstructive and aesthetic surgery; therapy of genitourinary tract diseases and injuries; therapy of thoracic cage and lung diseases and injuries; therapy of cardiovascular diseases and injuries, cardiopulmonary bypass; etiopathogenesis, classification and determination of malignant disease stage; specific features of development age surgery, symptomatology and diagnostics of diseases and injuries in childhood period; definition, types and way of organ and tissue transplantations, living donor transplant; organization and medicolegal aspects of organ transplantation; notion of anesthesia and resuscitation, preparation of patients for surgical treatment, types of anesthesia and surgical patient monitoring, post-surgical period patient procedures.
Exercises
Seeing connection between theoretical basics in surgery and specific features of nursing of patients with digestive and endocrine system injuries. Nursing of patients with locomotor system conditions. Nursing of patients with surgical conditions and injuries of blood and lymph vessels. Nursing of patients with surgical conditions and central and peripheral nervous system injuries. Nursing of patients with burns. Nursing of patients with surgical conditions and genitourinary tract injuries. Nursing of patients with surgical conditions and thoracic cage and lung conditions. Nursing of patients with surgical conditions and heart injuries. Nursing of patients after organ transplantation.

Literature:
Literature in Serbian:

1. Maksimović Ž.: Hirurgija, udžbenik za studente, CIBID, Beograd, 2008.
2. Stevović D. i sar.: Hirurgija, udžbenik, Savremena administracija, 2001.
3. Domazet N.: udžbenik, Hirurgija sa ortopedijom i traumatologijom, Beograd, 1996.
4. Terzić N.: Zdravstvena nega u hirurgiji, udžbenik, Lazarevac, 2006.
5. Драговић М.: Амбулантна хирургија, Веларта, Београд, 2006.

Literature in English:

6. Pudner R.: Nursing the Surgical Patient, Elsevier, New York, 2005.
7. Norton J., Barie P.S., Bollinger R.R., Chang A.E., Lowry S., Mulvihill S.J., Pass H.I., Thompson R.W.: Surgery: Basic Science and Clinical Evidence, Springer Publishing Company, New York, 2008.
8. Lewis L.S., Dirksen S.R., Heitkemper M.M., Bucher L.: Medical Surgical Nursing: Assessment and Management of Clinical Problems, Toronto, 2011.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	15	0	0	0

Methods of teaching:
Lecturea agains use of different viedo material, exercises, case studies, exercises on dummy, e-learning

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

BASICS OF ULTRASOUND DIAGNOSTICS

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Basics of Ultrasound Diagnostics**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	second year, fourth semester
ECTS:	9
Requirement:	Roentgen anatomy and Radiographic techniques

Course objective:
The objective of the course is familiarizing students with basics of ultrasound examination of organs and organ systems and acquisition of knowledge in the area of topographic ultrasound anatomy and morphology of organs and organ systems.

Course outcome:
Upon the completion of the course students will possess knowledge on ultrasound characteristics of certain tissues, organs and organ systems, and will be able to understand various modalities of ultrasound presentation of physiological conditions and pathological findings.

Lectures:
Ultrasound diagnostic devices, basic principles of operation, types of devices; Ultrasound examination as a diagnostic method, Technical properties of devices and ultrasound device rooms; Importance of training of professional radiology technician, cooperaton and relations between radiology technician and doctor; Communication between professional radiology technician and patient; Preparation of patient for ultrasound examination of different organ systems; Characteristic of ultrasound examination of soft tissues; Examination technique and ultrasound characteristics of the thyroid gland, liver, spleen, kidney, urinary tract (urinary bladder and prostate), breast, pelvis minor organs, endocranium; Ultrasound examination of bedridden patients; Ultrasound examination of pregnant women and small children; Ultrasound examination of oncology patients; Ultrasound examination in comparison with other methods of visualizing diagnostics; The latest generation of ultrasound devices, getting familiar with them.
Exercises:
Exercises are compatible with theoretical classes and imply practice and demonstrations in the teaching base; Getting familiar with ultrasound diagnostic devices and parts of devices; Getting familiar with basic notions of ultrasound terminology; Importance of appropriate preparation for ultrasound examination and examples of work in ultrasound room; Examination technique and analysis of ultrasound findings of ultrasound examination of the thyroid gland, liver, spleen, kidney, urinary tract (urinary bladder and prostate), breast, pelvis minor organs, endocranium; Ultrasound examination of pregnant women and small children; Ultrasound examination in comparison with other methods of visualizing diagnostics; Medical indications and costs.

Literature:
Literature in Serbian:
1. Lukač I., Kovačević N., Mijatović-Stefanović D. i sar.: Osnovi dijagnostičkog ultrazvuka u gastoenterologiji i nefrologiji, udžbenik, Zavod za udžbenike i nastavna sredstva, Beograd, 2004.
2. Palmer P. E. S.: Ultrazvučna dijagnostika, Narodna i univezitetska biblioteka Republike Srpske, Banja Luka, 2006.
Literature in English:
3. Escoffre J., Bouakaz A. (eds.): Therapeutic Ultrasound, Springer International Publishing, Kopenhagen, 2016.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	45	300	0	0

Methods of teaching:
lectures, exercises, video presentations, workshops, case analyses, demonstrations, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums/exam	20		

BUSINESS COMMUNICATION SKILLS

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Business Communication Skills**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, first semester
ECTS:	5
Requirement:	no

Course objective:
With his/her active participation in the learning process, student should acquire knowledge in the area of communications in order to acquire communication competency and skills required for professional work in nursing and treatment of senior citizens, organizational and team communication and in communication with social partners.

Course outcome:
At the end of the course student should be capable to apply the acquired knowledge in communication skills and to practically implement the acquired knowledge and skills within nursing.

Course content:
Lectures
General notions, aspects, types, parts of communication; communication competency in professional work; barriers in communication; specific characteristics of communication with elderly persons; importance of verbal and non-verbal communication with elderly persons; specific features of application of communication health care education methods with elderly persons; communication and health care educational counselling – supporting methods; first contact establishing and talking with patients; specific features and communication with persons with sensory perception disorders; ethics in communication; political and social correctness in communication; professional identity and communication; communication styles; emotional communication, empathy; communication as social support; communication and pathological distress in nursing elderly persons and in palliative care; therapy and informational communication; psychological-social aspect of communication; communication with persons under stress and in crisis; communication with persons of diminished sensory and verbal abilities; communication with families of elderly persons; communication in grievance; interpersonal communication; team work and social partners; public relations of organization with an aim of reaching mutual understanding and attaining common interests; communication in crisis situations; managing conflicts and their understanding.
Exercises
Aspects of communication. Verbal and non-verbal communication with the old. Empathy. Ethical principles. Creative workshops of exercising methods of verbal communication: speaking, listening, reading, writing. Non-verbal communication.. Specific aspects of communication with patients with sensory perception disorders. Team work. Therapy and informational communication. Implementation of health care educational methods with old persons. Managing conflicts and their solution. Application of SOLER technique. Communication and psychological distress in palliative care. Procedures in grievance period.

Literature:
Literature in Serbian:
1. Kekuš D.: Komunikacije u profesionalnoj praksi zdravstvenih radnika, II izd., udžbenik, Beograd, 2010.
2. Kekuš D.: Modeli integrisanih komunikacija u zdravstvu, udžbenik, Fakultet organizacionih nauka, Beogradu, 2009.

Literature in English:
3. Hugman B.: Healthcare Communication, textbook, Pharmaceutical Press, London, 2009.
4. Lloyd M., Bor R., Noble L.: Clinical Communication Skills for Medicine, textbook, Elsevier, New York, 2018.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, exercises, work in small groups, exercises in methodic, seminar papers, presentation to the group, method of practical activities of students.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums	20		

BUSINESS ENGLISH

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Business English**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	third year, fifth semester
ECTS:	5
Requirement:	no

Course objective:
Course objective is familiarization with characteristics of the English language, adoption of phrases and patterns necessary for communication at professional level and adoption of techniques of written and oral expressing in professional communication.

Course outcome:
Students will be able to apply the acquired knowledge in professional communication, create corresponding written forms in accordance with their professional communication and use speech patterns appropriate to a given situation.

Course content:
Lectures
Broadening of knowledge on past tenses, dependent and relative clauses; temporal conjunctions and temporal clause structure; historical and biographical texts; topics: health, connections and common life in English-speaking countries; extension of knowledge on future tenses, use of subjunctive, conjunctions, and relative clause structure; topics: sport, environment protections and business life in English-speaking countries; medical terminology relevant for student´s profession.
Exercises
Students are taught to communicate in different situations (at doctor´s, with service providers etc.), to seek and give information on the phone, to make bookings, to communicate in conflict situations, to express their views and feelings, to give accounts orally and in writing of past events through adequate use of past tenses and temporal conjunctions; students are taught to express their opinion orally and in writing on current topics, to participate in discussions, to independently present certain topics, to give reports on personal experience and to ask others on their experience.

Literature:
Literature in Serbian:
1. Dragović R.: Engleski za zdravstvene radnike, udžbenik, Naučna knjiga, Beograd, 2004.
Literature in English:
2. MacLean J.: English in Basic Medical Science, textbook, Oxford University Press, Oxford, 2000.Murphy R.: English Grammar in Use, Cambridge University Press, Cambridge, 2014.
3. McCarthy M., O'Dell F.: English Vocabulary in Use, Cambridge University Press, Cambridge, 2006.
4. Hornby A. S.: Oxford Advanced Learner's Dictionary of Current English, Oxford University Pres, Oxford, 2008.
5. Evans V., Dooley J., Tran T. M.: Career Paths, Medical Book 1, udžbenik, Express Publishing, Berkshire, 2018.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, practical exercises, communication, e-learning.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercieses/professional practice	40		
Colloquiums	20		

BUSINESS GERMAN

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Business German**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	third year, fifth semester
ECTS:	5
Requirement:	no

Course objective:
Course objective is familiarization with characteristics of the German language, adoption of phrases and patterns necessary for communication at professional level and adoption of techniques of written and oral expressing in professional communication.

Course outcome:
Students will be able to apply the acquired knowledge in professional communication, create corresponding written forms in accordance with their professional communication and use speech patterns appropriate to a given situation.

Course content:
Lectures
Broadening of knowledge on past tenses, dependent and relative clauses; temporal conjunctions and temporal clause structure; historical and biographical texts; topics: health, connections and common life in German-speaking countries; extension of knowledge on future tenses, use of subjunctive, conjunctions, and relative clause structure; topics: sport, environment protections and business life in German-speaking countries; medical terminology relevant for student´s profession.
Ecercises
Students are taught to communicate in different situations (at doctor´s, with service providers etc.), to seek and give information on the phone, to make bookings, to communicate in conflict situations, to express their views and feelings, to give accounts orally and in writing of past events through adequate use of past tenses and temporal conjunctions; students are taught to express their opinion orally and in writing on current topics, to participate in discussions, to independently present certain topics, to give reports on personal experience and to ask others on their experience.

Literature:
Literature in Serbian:
1. Menschen A1 KB und Menschen A1 AB, udžbenik (video materijal: http://matifmarin.blogspot.rs/p/menschen-film-stationen-clips.html), Klett Verlag, Stuttgart, 2018.
2. Pude E. A., Specht F.: Menschen, Deutsch als Fremdsprache Kursbuch mit DVD-ROM, udžbenik, Hueber Verlag, Munchen, Deutschland, 2012.
3. Loibl B. et all.: Schritte Plus im Beruf, Kommunikation am Arbeitsplatz, Max Hueber Verlag, Ismaning. Deutschland, 2015.
4. Vučković-Stojanović M.: Uvod u nemački poslovni jezik. Beograd: Savremena administracija, 2005.
5. Becker N., Braunert J.: Alltag, Beruf, Kursbuch+Arbeitsbuch, Max Hueber Verlag, Ismaning, 2009.
6. Becker N., Braunert J., Schlenker W.: Unternehmen Deutsch Grundkurs. Kursbuch, Klett Verlag, Stuttgart, 2005.
7. Becker N., Braunert J.: Unternehmen Deutsch Grundkurs, Arbeitsbuch, KlettVerlag, Stuttgart, 2004.
8. https://www.hueber.de/seite/pg_lernen_lerner_dvd_mns, knjiga i link.
9. https://www.hueber.de/seite/pg_lernen_uebungen_mns, dodatne on line vežbe.

Literature in English:
10. Grammatik - Ganz klar Übungsgrammatik A1-B1, uz audio materijal, Hueber Verlag, kratak pregled gramatike sa vežbanjima „Hallo aber Deutsch“.
11. Nikolovski V.: Gramatička vežbanja „Eine kleine Übungsgrammatik“, Zavod za udžbenike i nastavna sredstva, Schritte international 1, Grammatikspiele.
12. www.hueber
13. www.schubert

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, practical exercises, communication, e-learning.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		

Exercises/professional practice	40		
Colloquiums	20		

DEGREE PAPER

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Degree Paper**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	third year, sixth semester
ECTS:	10
Requirement:	passed all exams in 1st-3rd year

Course objective:
The objective is to train students to apply basic, academic general-education, specialist and specialist-applicative knowledge and methods in solving specific issues within Degree Paper topic. Within the Degree Paper, students, examining the available literature or through work in a health care institution or laboratory, or by statistical data analysis, deal with an issue, its structure and complexity and on the basis of the analyses made draw conclusions on possible ways of its solving. Students are also trained in writing the Degree Paper, presenting it within the set deadline and discuss the Paper with specialists in the relevant area.

Course outcome:
On the basis of knowledge and skills acquired in the course of their studies, students are able to do the paper in a health care institution or laboratory or to bibliographically collect specialist literature, write the paper and present it before the relevant board.

Course content:
Degree paper presents a specialist or research work of a student in which he/she familiarizes with the research methodology in all areas of importance for health care. The paper topic may be experimental or bibliographical. Upon the conducted research, student prepares his/her degree paper in the form containing the following chapters: introduction, theoretical part, paper methodology, results and discussion, conclusion, abbreviations (optional), enclosures (optional), literature, candidate CV, key documentation information. Paper defense consists of oral presentation of the paper by the student, asking questions by defense board members and student´s answer to those questions.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
0	0	0	300	0

Methods of teaching: In the course of degree paper writing, mentor gives necessary instructions to the student, directs him/her to relevant literature, assists student in the selection of research methods, in the analysis and processing of the obtained results, in drawing appropriate conclusions etc. Within this part of work on degree paper student has additional consultations with the mentor and, if necessary, with other theachers dealing with matters in the area of degree paper topic as well. If the paper relates to a health care institution, it is necessary to obtain approval of the institution.

Grade (maximum number of points is 100):
Degree Paper grade is a total of points obtained for:

- writing the paper, 20 points;
- paper subject matter, 30 points;
- paper presentation at its defense, 20 points;
- answers to questions of Defense Board members within Degree Paper defense, 30 points (3 x 10, three Board members).

DIAGNOSTIC RADIOLOGY

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Diagnostic Radiology**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	third year, fifth semester
ECTS:	10
Requirement:	Roentgen Anatomy and Radiographic Techniques

Course objective:
The objective of the course is acquisition of knowledge on methods of X-ray examination of thoracic and abdominal organs, X-ray anatomy and primary pathological findings, as well as acquisition of knowledge on obligations of a professional radiologist in medicine in connection with preparation of patients and his/her role in carrying out a diagnostic radiology method, to understand indications and contraindications in its application, as well as to be able to make a critical decision on comparison of diagnosis methods comparison.

Course outcome:
Upon the completion of the course students will possess skills of a professional radiologist in medicine: patient preparation, selection of contrast agents and possible side effects in the application of contrast agents, drugs and other accessories, carrying out of certain examinations, as well as identification of anatomic details and basic pathological changes relating to diagnostic radiology. Students will be trained in skills in the domain of professional radiologist in medicine required for the application of methods in chest and heart X-ray examination, remote control radiography, tomography, esophagus examination using barium sulfate, bronchography, mammography, galactography, diagnostic hepatobiliary tract and pancreas examination, sialography, fistulography, urography, urethocystography, hysterosalpingography, deferentovesiculography and other diagnostic radiology.

Course content:
Lectures:
Contrast agents, definition, classification; Side effects at application of iodine contrast agents, prevention, therapy; Methods of X-ray chest and heart/mediastinum examination – scopy, targeted graphy, remote control radiography, tomography, esophagus examination using barium sulfate; Bronchography; Basic pathological findings; Mammography, galactography; Contrast examinations of the digestive tract – monocontrast and dual contrast; Swallowing, examination of oesophagus, gasroduodenum, hypotonic duodenography, large intestine passage and irigography; Examination of hepatobiliary tract and pancreas: intravenous holegraphy, surgical and cholangiography through T drain; Contrast examinations of the urogenital tract: excretory urography with modifications, retrograde and anterograde urography, urethocistography; Deferentovesiculography; Methods of examination of retroperitoneal area; Each chapter includes: patient preparation, performing techniques, indications and contraindications; Roentgen device imaging and primary pathological findings, as well as comparison with new diagnostic methods (angiographies, US, KT, MR) and their domain of application.
Exercises:
Exercises are compatible with theoretical classes and imply practice and demonstrations in the teaching base.

Literature:
Literature in Serbian:
1. Lazić J. i sar.: Radiologija, Medicinske komunikacije, udžbenik, Medicinska knjiga, Beograd, 2007.
2. Bošnjaković P. i sar.: Praktikum kliničke radiologije, udžbenik, Data status, Beograd, 2009.
3. Wicke L.: Atlas radiološke anatomije, Data status, Beograd, 2007.
Literature in English:
4. Bontrager K. L., Lampignano J. P.: Textbook of Radigraphic Positioning and Related Anatomy, Mosby Elsevier, St. Louis, 2005.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
60	75	300	0	0

Methods of teaching:
lectures, exercises, video presentations, workshops, case analyses, demonstrations, klinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums/exam	20		

EMERGENCY MEDICINE AND NURSING IN SPECIAL CONDITIONS

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Emergency Medicine and Nursing in Special Conditions**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	third year, fifth semester
ECTS:	6
Requirement:	Basics of Nursing

Course objective:

Students are familiarized with prehospital and initial hospital organization and care of emergency and critical conditions in medicine, basic and extended measures of cardiopulmonary resuscitation. It is necessary to familiarize students with stages in determining the abrupt death and care of not only the dead person, but also of those left behind, as well as of a positive impact on friends and family. Possession of skills for practical application of the acquired knowledge in practice. Development of critical thinking.

Course outcome:

Familiarization of students with prehospital and initial hospital organization and care of emergency and critical conditions in medicine. Familiarization of students with mistakes that might happen during provision of care in emergency medical practice. Responsibilities of doctors in case of occurrence of abrupt death. Administration of medication and application of sophisticated technologies in emergency medicine and possibilities of their application in research work. Knowing how to apply basic and extended measures of cardiopulmonary resuscitation (in adults and children), basic and extended measures and procedures in taking care of injured persons (adults and children). Exercises are carried out on dummies and patients, as well as through presentations of possible medical cases with question, answers and discussion.

Course content:

Lectures

Principles of emergency medicine; evaluation of vital functions; pain as the fifth vital parameter; evaluation, maintenance and opening airway; artificial ventilation; acute chest pain (evaluation and care); acute coronary syndromes; cardiogenic shock; syncope; emergency states in vascular medicine (dissection, rupture, acute occlusions, deep vein thrombosis, embolies); peri-arrest arrhythmias (tachyarrhythmiae, bradyarrhythmiae); hypertensive emergencies; acute cardiac arrest; basic and extended measures of cardiopulmonary resuscitation in adults and children; death case – stages of determining abrupt death, communication with family; medicolegal aspects of emergency medicine; acute peripheral artery ischemia; acute active bleeding; hypovelomic shock; volume resuscitation; anaphylactic shock; respiratory insufficiency; acute affixion (identification signs, initial care); acute intracranial/spinal compression; acute intestinal obstruction; acute urinary obstruction; epilepsy and convulsions; delirium and acute confused states; acute headache; ischemic stroke; transitory ischemic attack; subarachnoid hemorrhage; increased body temperature in children; dehydrated child; trauma – heavy isolated and heavy multiple; prehospital primary examination (ABCDE principle) and stabilization at injury infliction site; prehospital care during transport; initial hospital care; acute poisoning.

Exercises

Evaluation and maintenance of airway – exercises on dummy. Side relaxing position – exercises on dummy. Mechanical devices and airway opening. Bolus obstruction in adults and children – exercises on dummy. Difficult airway. Artificial ventilation methods – exercises on dummy. Intravascular accesses (peripheral venous, central venous, intraosseous) – exrecises on dummy. Volume compensation infusion solutions. Vasoactive, inotropic and antiarrhythmic drugs as initial pharmacotherapy in emergency states (methods of administration, preparation, dosage, indications). Basic CPR measures in adults and children – exercises on dummy; ECG forms of cardiac arrest and ECG recognition of peri-arrest arrhythmia; early defibrillation (types of defibrillator, indications). Cardioversion. Transcutaneous cardiac pacing – exercises on dummy. Extended measures of CPR in children and adults – exercises on dummy. Cardiac arrest pharmacotherapy (types of medication, methods of administration). Asystole algorithm – exercises on dummy. Therapy algorithm of pulseless electrical activity – exercises on dummy. Therapy algorithm of ventricular fibrillation and ventricular tachycardia without pulse – exercises on dummy. Simulations of cardiac arrest and CPR in children and adults. Simulations of peri-arrest arrhythmia and care. External compression, compression bandage. MAST application. Nasogastric intubation. Urinary bladder catheterization. Anterior and posterior epistaxis. Needle thoracostomy. Decompressive needle pericardiocentesis – exercises on dummy. Multiple trauma simulations: primary ABCDE and secondary examination. Multiple trauma simulation – point system in diagnosis and assessment of outcomes of the traumatized. Sedation and analgesia (indications, types of medication and methods of administering). Familiarization with pre-hospital care. Institute of Emergency Medical Aid. Familiarization with contents of initial hospital care in emergency clinic.

Literature:

Literature in Serbian:

1. Pavlović A.: Prva pomoć, udžbenik, Obeležja, Beograd, 2007.
2. Kalezić N. i sar.: Inicijalni tretman urgentnih stanja u medicini, udžbenik, Medicinski fakultet, Beograd, 2016.
3. Vučović D.: Urgentna medicina, udžbenik, Obeležja, Beograd, 2002.
4. Pavlović A.: Kardiopulmonalno cerebralna reanimacija, Obeležja, Beograd, 2004.

5. Newton C. R. H., Khare R. K.: Urgentna medicina, Besjeda, Banja Luka, 2007.

Literature in English:

6. Advanced First Aid, CPR, and AED, American Academy of Orthopaedic Surgeons (AAOS), Jones & Bartlett Learning, 2017.
7. Cydulka R., Cline D., Ma O. J., Fitch M., Joing S., Wang V.: Tintinalli's Emergency Medicine Manual, textbook, McGraw-Hill Education, New York, 2017.
8. Hammond B. B., Zimmermann P. G. (ed.): Sheehy's Manual of Emergency Care: Sheehy's Manual of Emergency Care, textbook, Mosby, London, 2012.
9. Carsten Lott i sar.: Advaced life support course manual, European resuscitation council, ERC guidelines 2015.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	240	0	0

Methods of teaching:

lectures, exercises, case studies, discussion, e-learning, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums	20		

ETHICS IN HEALTH CARE

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Ethics in Health Care**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, first semester
ECTS:	5
Requirement:	no

Course objective:
Acquisition of basics of applied medicine ethics, understanding practical importance of ethics and recognizing differences between ethical and legal issues, development of critical thinking in the process of ethical analysis, understanding national, European and international legal regulations, knowing rights and responsibilities in health protection, health insurance, as well as knowing rights and responsibilities of providers of medical services, their beneficiaries and of the third party.

Course outcome:
After passing the exam, students will be able to critically think on normative and ethical principles, they will know the difference between legal and ethical issues, be able to make critical judgements at provision of health care services if they include moral duties and will be able to understand laws regulating aspects of health care activities, rights and responsibilities of health care professionals, patients and the third party.

Course content:
Lectures
Normative ethics in medicine; ethical principles of importance for health care professionals; theories of medical ethics; ethical norms in medical practice; ethical case studies in health care practice, moral values, misjudgment; mistakes in practice, moral and criminal liability of health care professionals; ethical judgement in observance of moral values and rights of patients; non-observance of codified principles; ethics in preclinical and clinical studies (basics); ethics committee; European and international regulations; national health care policy; Serbian Medical Chamber; medical license; court of honor.
Exercises
Analysis and discussion on case studies (information and data generation and critical assessment). Problem-based learning (problem-solving with appropriate explanation of ethical concept and legal framework). Panel discussions, application of ethics and laws in current issues (drug testing, suicide, placebo, euthanasia, keeping confidential information on patient and medicine).

Literature:
Literature in Serbian:
1. Marić J.: Medicinska etika, autorsko izdanje, Beograd, 2008.
2. Lazarević A.: Socijalna medicina, autorsko izdanje, 2005.
3. ICN regulativa i regulativa EU koje se odnose na sve aspekte leka, zdravstvenog osiguranja i prava i obaveza u pružanju zdravstvene zaštite, 2012.
4. Zakoni i podzakonska akta Republike Srbije iz oblasti zdravstva.
Literature in English:
5. Fregmen B. F.: Medical Law and Ethics, textbook, Prentice Hall, New Jersey, 2011

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, workshops, case study, problem-based learning, exercises

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

FIRST AID

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**First Aid**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	second year, third semester
ECTS:	5
Requirement:	no

Course objective:
Principal goals of first aid education is familiarization of students with principles of initial care of suddenly injured or fallen ill persons, acquisition of skills for practical application of the acquired knowledge in practice, immediate life-saving care of a casualty, other persons, to preserve the environment and to improve protection from further injuries and hazards.

Course outcome:
Familiarization of students with the forms of sudden ailments and injuries and methods of prompt and immediate care; skills in examination and prompt recognition of signs and symptoms in sick or injured persons requiring immediate and urgent care.

Course content:
Lectures
Examination and triage of the injured; evacuation of the injured (taking out, carrying out and transport); assessment of vital functions and state of consciousness; airway opening and keeping; bolus obstruction – partial, total, procedure algorithm in adults and children; artificial respiration – expiratory airflow; recovery positions of abruptly injured or sick person (side – relaxing, semi-side, stomach, semi-laying, semi-sitting, sitting, knee-elbow, kneeling, autotransfusion); cardiac arrest – identification and resuscitation measures in adults and children; application of semiautomated external defibrillators (AED); procedure algorithm – basic resuscitation measures in adults and children; bleeding – identification and procedures in external and internal bleeding; traumatic amputation care procedure; open injuries (wounds) – care; bone and joint system injuries (notion, types); temporary immobilization; head and vertebral column injuries; thoracic rib and stomach injuries; care procedures; complications and their prevention; injuries caused by heat and electricity, care; injuries caused by the cold, care; specific injuries, diseases and conditions, care.
Exercises
Examination and triage of the injured. Evacuation of the injured (taking out, carrying out and transport). Assessment of vital functions and state of consciousness. Airway opening and keeping. Bolus obstruction – partial, total, procedure algorithm in adults and children. Artificial respiration – expiratory airflow. Recovery positions of abruptly injured or sick person (side – relaxing, semi-side, stomach, semi-laying, semi-sitting, sitting, knee-elbow, kneeling, autotransfusion). Cardiac arrest – identification and resuscitation measures in adults and children. Application of semiautomated external defibrillators (AED). Procedure algorithm – basic resuscitation measures in adults and children. Bleeding – identification and procedures in external and internal bleeding. Traumatic amputation care procedure. Open injuries (wounds) – care. Bone and joint system injuries (notion, types). Temporary immobilization. Bone and joint system injuries (notion, types). Bone and joint system injuries (notion, types). Care procedures. Complications and their prevention. Injuries caused by heat and electricity, care. Injuries caused by the cold, care. Specific injuries, diseases and conditions, care.

Literature:
Literature in Serbian:
1. Pavlović A.: Prva pomoć, udžbenik, Obeležja, Beograd, 2007.
2. Pavlović A.: Kardiopulmonalna reanimacija, Obeležja, Beograd, 2007.
3. Newton C. R. H., Khare R. K.: Urgentna medicina, prevod, Besjeda, Banja Luka, 2007.
Literature in English:
4. Cydulka R., Cline D., Ma O. J., Fitch M., Joing S., Wang V.: Tintinalli's Emergency Medicine Manual, McGraw-Hill Education, New York, 2017.
5. Hammond B. B., Zimmermann P. G. (ed.): Sheehy's Manual of Emergency Care: Sheehy's Manual of Emergency Care, Mosby, London, 2012.
6. Carsten Lott i sar.: Advaced life support course manual, European resuscitation council, textbook, ERC guidelines 2015.
7. Advanced First Aid, CPR, and AED, American Academy of Orthopaedic Surgeons (AAOS), Jones & Bartlett Learning, 2017.

Number of classes

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, exercises, case studies; e-learning, exercies on dummy; visits of accredited specialists;

Grading (maximum 100 points)			
Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums	20		

GERIATRICS WITH NURSING IN GERIATRICS

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Geriatrics with Nursing in Geriatrics**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, first semester
ECTS:	5
Requirement:	no

Course objective:
Students will acquire knowledge and skills in nursing of senior citizens, understand their bodily, social and psychological needs and problems, be familiar with the possibilities of taking care of them in institution or at their home.

Course outcome:
Upon the course completion student should be able to recognize specific problems of the old, evaluate their functional abilities and possibilities of self-care, train them in self-care and treatment in senior citizens institutions and geriatric hospitals.

Course content:
Lectures
The notion of gerontology and geriatrics; physical, psychological and social aspect of getting old; recognition of problems of the old; theories of getting old, specific way of defining getting old, health issues, old-age illnesses, prevention of complications, treatment, nursing and rehabilitation; care categorization, therapeutic procedure, specific features of communication; most frequent health issues of the old, their prevention and treatment; the role of nurse in health protection and nursing of the old; specific features of nursing in senior citizen institutions and geriatric centers; specific features of medical rehabilitation of old persons; institutions taking care of the old; direction of geriatrics development in the EU; importance of psychical rehabilitation of the old; everyday life activities; psychophysical activity, elimination of the feeling of being deserted; team activities, past time activity organization, artistic and sports activities; care of local community for improvement of life of senior citizens (associations, day centers); gerontology centers, work organization, activities within centers; work in gerontology centers in Serbia and EU countries; importance of prevention; palliative care and work with families; education of population in volunteering; familiarization with social protection of old persons.
Exercises
Changes in certain body systems and organs due to getting old, basic human needs and getting old, evaluation of functional abilities and possibilities of self-care, most frequent health issues of the old, education in self-care and treatment. Specific features of the old patient population. Nursing of old persons, work in gerontology center. Organization of old person workshop. Importance of prevention. Assessment of conditions for home care. Cooperation with social work centers. Visiting senior citizens´ clubs. Demonstration of nursing procedures at home; education of families in taking care. Preparation of old persons and their accommodation in an institution. Training family in visiting and preparation for return home. Practical application of tests (fall prevention Katz index, Norton and Branden Scale – patient risk for pressure ulcer development etc.).

Literature:
Literature in Serbian:

1. Vukadinov J.: Gerijatrija i nega starih osoba, udžbenik, Medicinski fakultet, Novi Sad, 2006.
2. Šarenac D.: Zdravstvena nega starih, udžbenik, Licej, Beograd, 2009.
3. Stavljenić – Rukavina A., Renato Mitermayer R., Tomek Roksandić S., Mustajbegović J.: Kvaliteta dugotrajne skrbi starijih osoba, Centar za gerontolgiju, Referentni centar Ministarstva zdravlja RH za zaštitu zdravlja starijih osoba, priručnik, Zagreb, 2012.
4. Dujaković Z. i sar.: Gerijatrija - medicina starije dobi, udžbenik, Medicinska naklada, Zagreb, 2008.

Literature in English:

5. Boltz. M.: Evidence-Based Geriatric Nursing Protocols for Best Practice, 4th ed., Springer Publishing Company, New York, 2012.
6. Halter J. B., Ouslander J. G., Tinetti M., Studenski S., High K. P., Asthana S.: Hazzard's Geriatric Medicine and Gerontology (Principles of Geriatric Medicine & Gerontology), textbook, McGraw-Hill Education, New York, 2009.
7. Warshaw G., Potter J., Flaherty E., McNabney M. K., Heflin M. T., Ham R.: Ham's Primary Care Geriatrics, textbook, Elsevier, New York, 2021.
8. Taylor R.: Oxford Handbook of Palliative Care, Oxford Press, Oxford, 2009.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures against use of various video materials, exercises, workshops, clinical practice, visits of teaching base employees

Grading (maximum 100 points)			
Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums	20		

HEALTH CARE AND SOCIAL-SECURITY LEGISLATION

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Health Care and Social-Security Legislation**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	third year, sixth semester
ECTS:	5
Requirement:	no

Course objective:
Acquiring basic knowledge in health care and social-security legislation, knowing the difference between ethical and legal requirements, developing critical thinking in solving ethical or legal dilemmas, understanding national, European and international legal regulations, knowing rights and obligations relating to medical protection, health insurance, as well as knowing rights and obligations of medical service providers, their beneficiaries and third party.

Courses outcome:
Students who passed the exam are capable of critical thinking on standards and legal issues, they are aware of the difference between legal and ethical issues, and they acquired knowledge that would help them to critically judge ethical and legal aspects in providing medical services; they are able to apply laws regulating health care sectors, and know rights and obligations of medical care provider, patient and third party.

Course content:
Lectures
National health care policy, regulations on health care system; Act on Medical Protection, legal and sublegal regulations; Serbian Medical Chamber; medical license, court of honor; European and international regulations in health care system; noncompliance of prescribed principles; legal regulations on specific cases (drug testing, suicide, placebo, euthanasia, physician-patient privilege); ethics in pre-clinical and clinical tests (fundamentals); ethical board.
Exercises
Analysis and discussion on case studies (generation and critical assessment of information and data). Problem-based learning (problem-solving with an appropriate explanation of the ethical concept and legal framework). Panel discussions on application of legal principles on current issues (drug testing, suicide, placebo, euthanasia, physician-patient privilege).

Literature:
Literature in Serbian:
1. Lazarević A. i sar.: Javno zdravlje, socijalna politika i zdravstvena zaštita, udžbenik, Beograd, Visoka zdravstvena škola strukovnih studija, Beograd, 2016.
2. Aktuelni zakoni i podzakonska akta Republike Srbije iz oblasti zdravstva.
3. Lazarević A.: Socijalna medicina, autorsko izdanje, Beograd, 2015.
4. Simić S. i sar.: Socijalna medicina, udžbenik, Medicinski fakultet, Beograd, 2012.
5. Šolak Z.: Ekomnomika zdravstvene zaštite, Zavod za udžbenike i nastavna sredstva, Beograd 2003.

Literature in English:
6. Mossialos E., Permanand G., Baeten R., Hervey T.: Health systems governance in Europe: the role of European Union law and policy, Cambridge University Press, 2010.
7. De Gooijer R.: Trends in EU Health Care Systems, Winfried, 2007.
8. Morrisey M. A.: Health Insurance, textbook, Health Administration Press, London, 2007
9. Beik Janet I.: Health Insurance Today: A Practical Approach, textbook, Saunders, Philadelphia, 2010

Number of classes:

Theoretical lectures	**Theoretical exercises**	**Professional practice**	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, workshops, case studies, problem-based learning, e-learning.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

HUMAN RESOURCES MANAGEMENT IN HEALTH CARE

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Human Resources Management in Health Care**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	second year, fourth semester
ECTS:	5
Requirement:	no

Course objective:
Familiarization of students with the concept of human resources management. The intention of the course is to present to students principal issues in human resources management and segments of manager activities, with human resources management as one of most important. The final goal of the course predominantly determines the selection of contents (topics) and method or classes realization.

Subjects outcome:
Students will be able to apply the acquired knowledge in human resources management within their future profession.

Course content:
Lectures
Introduction into human resources management; main activities of personnel management and human resources management; differences between human resources management and personnel function; social protection in industry; recruitment and selection; adoption of other personnel activities; legislation; flexibility and diversity; information technology; professional associations of personnel members; human resources management; main characteristics of human resources management; issues of human resources management concept; human resources management marketing; human resources strategy and planning; strategy devising process; human resources planning; anticipation of human resources demand; job analysis; evaluation of internal and external human resources supply; unemployment; underqualification; competition; geographical factor; assets; development; rewarding; relations with employees; the European Union: recruitment procedures; job description and person specification, competence profile; person specification, competence profile in the recruitment context; vacancy advertising; targeted recruitment; administrative procedures; supplementary selection techniques; psychological testing; recommendations; health check; relations in employment; rights and responsibilities of both parties; Law on Employment; retirement; payment for work done or performance evaluation; role of employer; impact of personal problems on the job; confidentiality; counseling skill; communication process; hierarchical communication levels; protection at work; working time regulation in the EU; risk assessment; partnership and involvement of employees; employee involvement techniques; basic characteristics of disciplinary procedure; absence control; the role of human resources manager; dismissal and redundancy; fixed-term service agreement; illegal dismissal; rights of dismissed employees; work abroad.
Ecercises
CV analysis – case studies. Recruitment of potential candidates, candidate selection – simulation. Employee training – workshop; coaching – simulation. Feedback – simulation. Leadership, difference between leader and director, leader´s skills – workshop, simulation. Individual and group business meetings – simulation. Team spirit and team-building – workshop. Evaluation of employees´ performance, employee personal development plan – case study and simulation. Motivation – workshop. Defining rule system, positive and negative bonus – workshop. Leaving the company, agreement termination, dismissal – workshop, simulation. Change of employee position, recognizing employee´s potential and optimum job positions – workshop. Visits from economic sector (director of a successful company with a great number of employees).

Literature:
Literature in Serbian:
1. Legetić B.: Principi menadžmenta, udžbenik, Ekonomski fakultet, Subotica, 2007.
2. Marinković Lj: Menadžment u zdravstvenim organizacijama, G.A.D. Beograd, 2001.
3. Mićović P.: Zdravstveni menadžment, Obeležja, Beograd, 2008.
4. Žujić D.: Menadžment ljudskih resursa i kvalitet, Centar za primenjenu psihologiju društva psihologa Srbije, Beograd, 2003.
5. Probbins S., Judge T.: Organizaciono ponašanje, Mate, Zagreb, 2009.
6. Frančesko M.: Kako unaprediti menadžment u preduzeću, Novi Sad, Prometej, 2003.
Literature in English:
7. Beik J. I.: Health Insurance Today: A Practical Approach, Saunders, Philadelphia, 2010.
8. Flynn W. J., Mathis R. L., Jackson J. H.: Healthcare Human Resource Management, textbook, Cengage Learning, Boston, 2006.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)

30	30	0	0	0
Methods of teaching: lectures, practical exercises, workshop, discussion, simulation, case study, e-learning				
Grading (maximum 100 points)				
Pre-Exam obligations		**Points**	**Final Exam**	**Points**
Lecture attendance		3	Exam	40
Activity		7		
Projects/Seminars		0		
Exercises/professional practice		20		
Colloquiums		30		

HYGIENE WITH THE BASICS OF MICROBIOLOGY

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Hygiene with the Basics of Microbiology**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	first year, second semester
ECTS:	5
Requirement:	no

Course objective:

Acquisition of knowledge on health care training process as a measure of health protection at all levels, familiarization with principles, objectives and methods of application of health care educational measures and impact on change of risky behavior of individual, family and community. Development of interest of student in his/her permanent professional and general education, that its, training of health care professional in risk management in health care institutions. Familiarization with cell organization and main characteristics of bacteria, viruses and parasites.

Course outcome:

Students acquire practical knowledge on professional competencies within their profession, on the analysis and management of risk in health care institutions regarding hygiene and protection of health of medical professionals and beneficiaries of health care services at all levels of health protection.

Course content:

Lectures

Hygiene and health; hygiene requirements in planning and construction of health care institutions; illumination, ventilation and heating in health care institutions; air quality in health care institutions; water and health; health safety of drinking water; water supply of health care institutions; disinfection of drinking water; disposal of solid and liquid waste; disposal of medical waste; personal hygiene of health care professionals: hand hygiene and personal protection substances; hygiene procedures in maintaining hygiene of sick persons; hygienic-epidemiologically adequate solutions of sanitary area; hygienically adequate treatment of hospital laundry; hygienic requirements for kitchens and food distribution; application of HACCP system in food and drinking water handling; international and Serbian legislation in the area of food and general use objects safety; risk management in health care institutions; determining critical spots in health care institutions; epidemiological importance of defining critical spots and critical spot control plan in health care institutions; health care education in the system of scientific disciplines; health: modern concept; health education of the young; factors affecting health; lifestyle; life, health and environment; health promotion and improvement; behavior and changes in behavior; disease prevention; education, counseling and informing; planning, carrying out and evaluation of health care educational interventions in institutions of primary, secondary and tertiary protection; communication, educational and organizational methods and strategies; WHO seven educational principles; carrying out health care educational intervention – professional nurse in the health care system; general bacteriology; microorganism classification, anatomy and physiology of bacterial cell, bacteria metabolism, action of physical and chemical agents on microorganisms; pathogenecity and virulence factors, antibiotics, antimycotics and chemotherapeutics, physiological importance of microflora, rapid diagnostic tests and molecular methods in microbiology; general and special virusology: general features of viruses, action of physical and chemical agents on viruses; pathogenesis and control of virus infections, interferons and antiviral drugs, laboratory diagnostics, DNA and RNA and viruses of importance for human pathology; parasitology.

Exercises

Planning hygienic requirements for health care institutions. Presentation of test results and air quality evaluation. Air sampling methods in health care institutions. Presentation of test results and evaluation of health safety of water. Disinfection of drinking water. Drinking water sampling methods. Environmentally adequate disposal of medical waste. Preparation for seminar paper: monitoring personal hygiene of health care professionals. Presentation of seminar paper in the area of monitoring personal hygiene of health care professionals. Drawing up HACCP system for kitchens in health care institutions. Determining critical spots in health care institutions. Demonstration of health care institution functioning in terms of hygienic requirements – field visit. Demonstration of functioning of microbiology institution and involvement in microbiological analysis.

Literature:

Literature in Serbian:

1. Novaković B., Grujić V.: Higijena i zdravstveno vaspitanje, udžbenik, Medicinski fakultet, Novi Sad, 2005.
2. Kekuš D.: Zdravstveno vaspitanje, udžbenik, Digital art, Beograd, 2009.
3. Kristoforović-Ilić M.: Higijena sa medicinskom ekologijom, udžbenik, Ortomedics, 2003.
4. Baračkov N., Bujak J., Ilić D., Jović S., Panić M. i sar.: Vaspitanje za zdravlje kroz životne veštine, Ministarstvo prosvete i sporta Republike Srbije, 2007.
5. Graser S., Hill E., Potter B., Матијевић С., Јовић С.: Промоција здравља заснована на доказима, Министарство здравља Републике Србије, 2006.

Literature in English:

6. Weston D.: Infection Prevention and Control: Theory and Practice for Healthcare Professionals, John Wiley & Sons, New Qork, 2008.

7. Andersen B. M.: Prevention and Control of Infections in Hospitals, textbook, Practice and Theory, Springer, Berlin, 2016.
8. Tortora Gerard J., Funke Berdell R., Case Christine L.: Microbiology: An Introduction, textbook, Books a la Carte Edition, Benjamin Cummings, New York, 2009.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	330	0	0

Methods of teaching:
lectures, practical classes, discussion, problem-solving, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

INTERVENTIONAL VASCULAR AND NON-VASCULAR METHODS

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Interventional Vascular and Non-vascular Methods**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	third year, sixth semester
ECTS:	10
Requirement:	Diagnostic Radiology

Course objective:
The aim of the course is for students to master the knowledge of when and how to use modern interventional vascular and non-vascular radiological methods.

Course outcome:
At the end of the course, students will know the reasons and ways of applying modern interventional vascular and non-vascular radiological methods.

Course content:
Lectures:
General principles of interventional radiology; Angiography equipment and room; Angiography interventional procedure; Image acquisition modalities; Angiotherapy – blood vessel occlusion; Embolization materials; Occlusion and protective balloons; Embolisation in traumas, haemoptyses, oesophagial varix bleeding, gastrointestinal bleeding, kidney, tumors, liver, urinary tract; Lung and mediastinum biopsy; Angioplasty – principles, accessory, stents; Aorta and main arteries angioplasty, percutaneous extraction of impurities in the vascular system; Endoscopic retrograde cholangiopancreatography, percutaneous cholangiography, nephrostomy, stent insertion in inoperable tumors of the gastrointestinal tract, hysterosalpingography; Radiofrequency ablation of liver, kidney and bone tumors; Limography.
Exercises:
Angiography devices, equipment, room, vital functions monitoring, injector, manipulation; Basic principles of RIS and PACS; Familiarization with catheters and other equipment; Embolization material; Preparation of patients for embolization; Chemoembolization and principles of a selective approach; Angioplasty, principles, accessory, stents; Short educational films.

Literature:
Literature in Serbian:
1. Goldner B. , Sagić D.: Klinička radiologija kardiovaskularnog sistema, Medicinski fakultet, Beograd, 2009.
2. Hebrang A., Klarić Čustović R.: Radiologija, Medicinska Naklada, Zagreb, 2007.
3. Marković Ž.: Vaskularna interventna radiologija, Medicinski fakultet, Beograd, 1998.

Literature in English:
4. Brian Funaki, Jonathan Lorenz, Thuong Van Ha: Teaching Atlas of Vascular and Non-vascular Interventional Radiology, Kindle Edition, New York, 2021.
5. Marcelo Guimaraes: Uflacker's Atlas of Vascular Anatomy, Kindle Edition, New York, 2020.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
60	60	270	0	0

Methods of teaching:
lectures, exercises, video presentations, workshops, case analyses, demonstrations, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums/exam	20		

MARKETING OF HEALTH CARE INSTITUTIONS

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Marketing of Health Care Institutions**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, second semester
ECTS:	5
Requirement:	no

Course objective:
Students acquire basic knowledge in the area of marketing in health care, get familiar with modern methods of marketing strategies and manner of communication in health care marketing. Accordingly, the primary course objective is to familiarize students with the genesis and goal of various areas of strategic marketing, including its dominant theories, which is necessary for successful development of activities. Students will also acquire knowledge on notions of marketing campaign, marketing plan designing and principal methods used in marketing.

Course outcome:
Upon the completion of the course, students will be able to understand strategic marketing and be capable to independently conduct research of marketing methods convenient for solution of a specific project task. Students will also be competent to evaluate relevant theories of strategic marketing in different empirical contexts and to understand interconnection between marketing strategy, operative-organizational parts of enterprises and market results. Students will understand how to manage marketing campaign, notion of marketing plan designing and primary methods used in marketing.

Course content:
Lectures
Nature and character of marketing; evolution of marketing and approaches in studying it; marketing management process; changes of marketing in enterprises; presentation and analysis of marketing environment; marketing information system and market research; market analysis; market segmentation and selection of targeted markets; notion of public perception; importance of marketing in health care in strategic marketing; market research; SWOT analysis, benchmarking and portfolio; BCG matrix; integrated marketing communications; promotional health campaigns; prevention, promotion of public health and marketing; value chain and cost efficiency; general principles of marketing (marketing mix, models, methods and marketing techniques); designing promotional campaign plan; targeting; following post-marketing campaign; medical marketing practice code; general marketing and targeted marketing campaigns; marketing outsourcing, marketing agencies; printed material, printed media, billboards, electronic media, social networks; direct marketing; fairs, conferences, meetings; sponsorships; website; promotional material; presentation; marketing and PR; public appearances of employees; dress code; appearance of employees, institution.
Exercises
Analysis and discussion on practical examples of marketing campaigns – workshops. Market segmentation and research; SWOT analysis, benchmarking and portfolio. Designing promotional campaign plans – workshop on a given topic in health care. Analysis of examples of marketing campaigns in Serbia and globally, workshops, e-learning, internet searching. Marketing in health care in Serbia – workshop. Designing promotional campaign plan on a given topic in health care, targeting, marketing mix, marketing models, methods and techniques – workshop. Printed material, printed media, billboards, electronic media, social networks – conceiving material on given topic in health care. Direct marketing – simulation. Fairs, conferences, meetings – workshop. Sponsorships. Website – workshop. Promotional material – workshop. Presentation; marketing and PR. Public appearance of employees. Dress code – visit. Appearance of employees, institution. Visits from business community (marketing or PR manager of health care institution, marketing or PR manager of a business organization).

Literature:
Literature in Serbian:
1. Kotler P.: Upravljanje marketingom, udžbenik, Mate, Zagreb, 2017.
2. Macura P.: Marketing – mikro, mala i srednja preduzeća, udžbenik, Ekonomski fakultet, Banja Luka, 2009.
3. Tasić Lj.: Farmaceutski menadžment i marketing, Nauka, Beograd, 2002.
Literature in English:
4. Berkowitz N. E.: Essentials of Health Care Marketing, textbook, Jones & Bartlett Learning, Boston, 2010.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, discussions, case study, workshop, visiting lectures of repesentatives of business community (marketing or PR manager of a health care institution, marketing or PR manager of business organization), exercises, e-learning

Grading (maximum 100 points)

Pre-Exam obligations	Points	Final Exam	Points
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/Professional practice	20		
Colloquiums	30		

MENTAL HYGIENE

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Mental Hygiene**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	third year, fifth semester
ECTS:	5
Requirement:	no

Course objective:
Students are trained to perceive phenomena of mental health and mental illness from a wider, multidisciplinary and multidimensional aspect, to assume responsible tasks in protection and improvement of mental health in their work within community, as well as to take care of sick persons against use of high technology and preserve human relationships in institutions and patients homes.

Course outcome:
Adoption of knowledge and mastering skills in evaluation, monitoring, creating and carrying out therapy communication with health protection beneficiaries – persons with mental health issues, members of their families and healthy members of the community.

Subjects content:
Lectures
Subject and theoretical fundamentals of mental health; prevention of mental disorders; mental health of the entire human life cycle: birth and childhood; adolescence; adulthood; old age; modern life problems: alienation; living in urban environment; living in rural environment; nutrition issues; physical activities; life crises; sickness and disablement in family; stress and burn-out syndrome; emergencies; refugees, armed conflicts; natural disasters; posttraumatic conditions; social pathology and maladaptive behavior; extramarital status; LGBT population; domestic violence; violence against women; violence against old people; alcoholism; drug-addiction; prostitution; religious sects; pathological gambling; suicidality; new forms of addiction; approach to person from mental-hygiene aspect: health and sickness; dying and death; dehumanization and humanization of relations; communication in health care profession; comprehensive protection of mental health.
Ecercises
Following theoretical classes. Case studies. Visits of representatives from relevant associations. Drawing up seminar papers. Devising conceptual project plans relating to current issues. Visit of a genuine representative of a marginalized group. Analysis of projects (city, provincial, republic) dealing with marginalized groups of people in the country. Visits of members of aid providing associations (victims of armed conflicts, natural disasters, etc.).

Literature:
Literature in Serbian:

1. Simić M., Kovačević K.: Mentalna higijena, udžbenik, autorsko izdanje, Beograd, 2004.
2. Kaličanin P. i sar.: Stres, zdravlje, bolest, udžbenik, Obeležja, Beograd, 2007.
3. Berger D.: Zdravstvena psihologija, Društvo psihologa Srbije, Centar za primarnu psihologiju, Beograd, 2002.
4. Havelka M. i sar..: Zdravstvena psihologija, Naklada Slap, Jastrebarsko, 2002.
5. Nikolić D.: Bolesti zavisnosti, Narodna knjiga-Alfa, Beograd, 2007.
6. Stanković Z., Begović D.: Alkoholizam od prve do poslednje čaše, Kreativni centar, Beograd, 2005.

Literature in English:

7. Bell G. E.: The Good Book of Mental Hygiene, Resource Publications, Borston, 2020.
8. Glen A.: Mental Hygiene: How To Change Your Mind, CreateSpace Independent Publishing Platform, London, 2018.
9. Tria G. E., Gaerlan J. E., Limpingco D. A.: Principles of Mental Hygiene, Pantas Publishing & Printing, Roterdam, 2010.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, exercises, workshop, discussion, seminar paper.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/seminar papers	0		
Exercise/professional practice	20		
Colloquiums	30		

MODERN DIAGNOSTIC RADIOLOGY METHODS

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Modern Diagnostic Radiology Methods**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	third year, sixht semester
ECTS:	9
Requirement:	Diagnostic Radiology

Course objective:
The objective of the course is familiarization of students with the basics of ultrasound CT and MR imaging diagnostics and other modern diagnostic methods applied in examination of different organs and organ systems.

Course outcome:
Upon the completion of the course, students will possess knowledge and skills for individual and team work in ultrasound CT and MR imaging diagnostics and other modern diagnostic methods applied in examination of different organs and organ systems.

Course content:
Lectures:
Classification of diagnostic radiology methods; diagnostic CT devices, patient preparation for examination of different organ systems; Nervous system CT imaging; Bone CT imaging; Chest CT imaging; Heart CT imaging; Abdomen, retroperitoneum, soft tissue and skeletal system CT imaging; Virtual colonoscopy, cytoscopy, bronchoscopy; CT coronography.
Diagnostic MR devices; Central nervous system MR imaging; Bone MR imaging, Heart MR imaging; Abdomen, retroperitoneum, soft tissue and skeletal system MR imaging; MR coronography.
Exercises:
Examination technique and analysis of ultrasound CT and MR imaging of the central nervous system, bones, chest, heart, abdomen, retroperitoneum, soft tissue and skeletal system..

Literature:
Literature in Serbian:
1. Lukač, Kovačević N.: Osnovi dijagnostičkog ultrazvuka u gastroenterologiji i nefrologiji, udžbenik, Data status, Beograd, 2004.
2. Hebrang A., Klarić Čustović R.: Radiologija, udžbenik, Mladinska naklada, Zagreb, 2007.
3. Lalošević Đ. i sar.: Radiologija, udžbenik, autorsko izdanje, Beograd, 2012.
Literature in English:
4. Hagga J.: CT and MRI of the Whole Body, Vol. 2 (Computed Tomography and Magnetic Resonance Imaging of the Whole Body), Mosby Elseiver, Philadelphia, 2009.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
60	60	300	0	0

Methods of teaching:
lectures, exercises, video presentations, workshops, case analyses, demonstrations, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums/exam	20		

ORGANIZATION OF HEALTH CARE SYSTEMS

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Organization of Health Care Systems**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, second semester
ECTS:	5
Requirement:	no

Course objective:
Course objective is to familiarize students with basics in organization of health care institutions and health care sector, manner of institution management, specific features of decision-making process in health care, motivation and medical team building, characteristics of internal communication in health care institutions, personnel and human resources building up, characteristics of business policy and planning strategy, administrative procedures and change management in health care institutions, mandatory and other forms of health insurance.

Subjects outcome:
Upon completing the course, student will be able to organize medical teams, ensure solid communication within health care institution, efficiently make decisions and manage changes under time pressure and understand systems of mandatory and other forms of health insurance.

Subjects content:
Lectures
Health care system; the role of good communication; health care system and health care institution management; the role of manager, difference between commanding and leadership; employment policy and schedule; introduction process, interview and integration of new employees; training; health care institution organization; primary, secondary and tertiary health protection; types of health care institutions; Law on Health care Protection; principles of health protection; protection of population from infectious diseases; chamber of medical practitioners; administration bodies in charge of health care; inspection supervision.
Exercises
Discussion on organization of health care processes, health care institutions and health insurance. Analysis of practice in Serbia and abroad. Analysis of practical examples in the sphere of environment protection. Analysis and practical examples in the sphere of smoking and alcohol ban.Analysis and discussion; living environment, air protection. Analysis and discussion; process of waste removal from health care institutions.

Literature:
Literature in Serbian:

1. Ranković-Vasiljević R., Stojanović-Jovanović B., Terzić-Marković D.: Metodika i organizacija zdravstvene nege, Visoka zdravstvena škola strukovnih studija, Beograd, 2015.
2. Milović Lj.: Organizacija zdravstvene nege sa menadžmentom, udžbenik, Naučna knjiga, Beograd, 2004.
3. Tijanić M. i sar.: Zdravstvena nega i savremeno sestrinstvo, Naučna knjiga, Beograd, 2010.

Literature in English:

4. Beik Janet I.: Health Insurance Today: A Practical Approach, Saunders, Philadelphia, 2010.
5. Mossialos E., Permanand G., Baeten R., Hervey T.: Health Systems Governance in Europe: The Role of European Union Law and Policy, textbook, Cambridge University Press, 2010
6. Morrisey M. A.: Health Insurance, textbook, Health Administration Press, London, 2007.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, workshop, case study, discussion, e-learning

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

ORGANIZATION OF RADIOLOGY WARD

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Organization of Radiology Ward**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	second year, fourth semester
ECTS:	4
Requirement:	no

Course objective:

The objective of the course is to familiarize students with the basics of organization of health-care institutions and health-care sector, methods of institution management, decision-making process in health-care, motivation of personnel, setting up of health-care teams, specific features of business communication in health-care institutions, specific features of activity policy and planning strategy, administrative procedures, change management in health-care institutions, forms of mandatory and other types of health insurance etc. There is a special emphasis on development of student capabilities aimed at professional and rational planning of work process in radiology, selection of most economic work methods, as well as a development of critical and self-critical approach to radiology ward organization within a health-care institution.

Course outcome:

Upon the completion of the course students will possess basic knowledge in organization or work in radiology wards, as well as in health-care system in general with an aim of its application in practice and future job. Students will be able to join health teams, to maintain a good business communication within a health-care institution, efficiently make decisions and manage changes, as well as to understand the system of mandatory and other forms of health protection. Students will also acquire knowledge and skills to plan the work process in radiology ward in a professional way, to select the most economic methods of work and to adopt a critical and self-critical approach to radiology ward and health-care institution organization.

Course content:

Lectures:

Basic notions of organization of health care as a science. Theoretic directions in health care and health-care institution organization. Primary, secondary and tertiary health protection. Organizational models. Types of health insurance, mandatory health insurance. Management and management function, notion of manager in health care, difference between commanding and leading. Conflict and types of conflict. Decision making and problem solving. The importance of good business communication. Work motivation, positive and negative bonus system. Evaluation. Health-care activity. Health-care technology. Education of managers in health care. International health cooperation. Legal regulations in the area of ionizing radiation protection. Organization of radiology ward in our country and abroad. Economy in radiology activities organization process. Sources and methods of obtaining funds. Internal reserves. Personnel policy in radiology ward and health care system in general, policy and pace of employment, reception process, interview conducting and integration of newly employed persons. Training. Reference system and accreditation of health-care institutions. Health-care professional chambers. Bodies of republic administration in health-care system. Environmental legislation. Nature, living environment protection. Environment protection fund. Waste management. Inspection supervision.

Exercises:

Examples from practice, organization of radiology ward in certain health-care institutions (outpatient clinics, hospitals, large health-care centres, radiology institutes). Discussion of topics dealing with health-care system organization process, health-care institutions and health insurance. Analysis of practical experience in Serbia and abroad. Analysis of radiology activity organization in our country and comparison with other organizational models of radiology wards worldwide. Proposition of measures aimed at improvements in practice – workshop. Analysis of critical examples in the domain of environment protection.

Literature:

Literature in Serbian:

1. Milanović M.: Organizacija i istorija radiološke službe, udžbenik, Beograd, 2005.
2. Milović Lj.: Organizacija zdravstvene nege sa menadžmentom, udžbenik, Naučna knjiga, Beograd, 2004.
3. Mićović P.: Zdravstveni menadžment, udžbenik, ECPD, Beograd, 2008.
4. Službeni glasnici Republike Srbije.

Literature in English:

5. Morrisey M. A.: Health Insurance, 1st ed., Health Administration Press, New York, 2007.
6. Beik J. I.: Health Insurance Today: A Practical Approach, 3rd ed., Saunders, Philadelphia, 2010.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	15	0	0	0

Methods of teaching:

lectures, exercises, workshops, discussions, e-learning.			
Grading (maximum 100 points)			
Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums/exam	30		

PATHOPHYSIOLOGY

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Pathophysiology**
Language of instruction:	English, Serbian
Subjects status:	mandatory
Semester:	second year, third semester
ECTS:	6
Requirement:	Anatomy and Physiology segment 1 (General Pathophysiology: theoretical + practical exam) is a condition for segmet 2 (Special Pathophysiology: theoretical + practical exam)

Course objective:

Acquisition of knowledge on cell tissue and organ damaging mechanisms and familiarization of students with morphological alterations underlying diseases, ability to recognize morphological alterations on cells, tissues and organs, enabling students to get to know etiology, pathogenesis and clinical manifestations of most important metabolic disorders and functional disorders of organs and organ systems, causes and mechanisms of cell malignant transformation, as well as characteristic of tumor growth and changes it causes in organism.

Course outcome:

Upon the completion of the course students have a command of basic medical terminology and are able to adequately present medically relevant facts, understand etiology and pathogenesis of principal metabolic and functional disorders of human organs and organ systems. They are able to connect their clinical manifestations with causes and mechanisms of their appearance and have a basic pathobiological knowledge enabling them to understand mechanisms of chemical agents and drug action, as well as a diagnostic strategy in case of pathological occurrences at a level required for competent carrying out of their duties.

Course content:

Lectures

Adaptation, growing old, death of cell; morphological changes in cell; acute and chronic inflammation etiopathogenesis; malignant cell transformation and its growth; water and electrolyte transport disorder; acid-base disorders; etiopathogenesis; undernutrition, obesity, diabetes mellitus, artherosclerosis, cardiovascular system function disorder, respiratory system function disorder, renal function disorder, nervous system function disorder, endocrine gland and neuroendocrine regulation function disorder, digestive system disorder, blood composition and function disorder, skin function disorder.

Exercises

Cell injury and cell death. Inflammation etiopathogenesis. Malignant transformation of cell and its growth. Water, sodium and potassium transport disorder. Calcium, magnesium and phosphate metabolism disorders. Etiopathogenesis of diabetes mellitus, artherosclerosis, acid-base. Disorders of cardiovascular, respiratory system, renal function, nervous function, endocrine gland and neuroendocrine regulation function, digestive tract and liver, blood composition and function.

Literature:

Literature in Serbian:

1. Radić S.: Opšta patofiziologija, udžbenik, Medicinski fakultet, Niš, 2012.
2. Beleslin B.: Specijalna patološka fiziologija, Beograd, 2008.
3. Babić Lj., Borota R., Lučić A.: Priručnik praktičnih i seminarskih vežbi iz patološke fiziologije, Medicinski fakultet, Novi Sad, 2007.
4. Ubavić M.: Patološka fiziologija, interne skripte, ICEPS, 2017.
5. Gamulin M., Marušić M., Kovač Z.: Patofiziologija, udžbenik, Medicinska naklada, Zagreb, 2005.
6. Maličević Ž. i sar.: Osnovi patološke fiziologije, udžbenik, Panevropski univerzitet Apeiron, Banja Luka, 2009.
7. Kovač Z., Gamulin S. i sar.: Patofiziologija, Zadaci za problemske seminare, Medicinska naklada, Zagreb, 2006.

Literature in English:

8. Huether S. E.: Understanding Pathophysiology, Elsevier, London, 2011.
9. Nolan A.: Pathophysiology: Step By Step Guide for Nursing, textbook, Kindle Edition, London, 2020.
10. Banasik J. L.: Pathophysiology, textbook, Saunders, New York, 2018.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
45	30	0	0	0

Methods of teaching:

lectures, practical classes, problem-oriented tasks, case studies, discussion, visits of medical-biochemical laboratory employees.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30

Activity	7		
Projects/Seminars	0		
Exercises/professional practice	30		
Colloquiums	30		

PHARMACOLOGY AND DRUG DOSING

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Pharmacology and Drug Dosing**
Language of instruction:	English, Serbian
Course status:	mandatory
Semester:	second year, fourth semester
ECTS:	5
Requirement:	no

Course objective:
Acquisition of knowledge on drug effect mechanisms on the basis of which information necessary for understanding different effects of drugs is obtained, therapy and side effects of groups of drugs are understood, as well as acquisition of principles of use of drugs in therapy.

Course outcome:
Upon the completion of the course, students are expected to be able to identify mechanisms of different effects of certain groups of drugs, to connect therapy and side effects of certain groups of drugs with their different pharmacologic effects, and to have own critical attitude to drugs.

Course content:
Lectures
Introduction; history of pharmacology; pharmacology division; drug division; general principles and drug development; manner of drug administration; dosing; LADMER (liberation, absorption, distribution, metabolism, elimination and response of organism to administered drug); effects of drugs on organism; type and character of drug effects; drug effect mechanisms; factors affecting drug effects; change of drug effects at second administration; mutual effects of drugs; detrimental drug effects; drug addiction; basics of clinical pharmacology; nonsteroidal anti-inflammatory drugs; antirheumatic drugs modifying the course of rheumatic condition; blood pharmacology: anticoagulant and coagulant drugs; antiaggregation drugs; local and system hemostatics; antianemic drugs; water and electrolytes: fluid compensation agents; parenteral nutrition drugs; respiratory tract pharmacology; cardiovascular system pharmacology, drugs and therapy of peripheral vascular conditions; antilipemic agents; digestive tract pharmacology, immunosuppresives and immunostimulants; vitamin pharmacology; obesity treatment drugs; antimicrobe drug pharmacology; hormone pharmacology, antifungal drugs; antiviral drugs; amebecides; antimalarial drugs; antiparasitic drugs; antiseptics and disinfectants; chemotherapy of malignant diseases.
Exercises:
General principles and drug development. Work with pharmacologic databases on the internet. Drug division. Drug prescribing. Prescription.

Literature:
Literature in Serbian:

1. Đaković Švajcer K.: Osnovi farmakologije, udžbenik, Ortomedics, Novi Sad, 2010.
2. Varagić V., Milošević M.: Farmakologija, udžbenik, Elit Medica, Beograd, 2005.
3. Stanimirović V.: Lek-doza-vreme i pacijent u bolnici, Medicinski fakultet Kragujevac- pomoćni udžbenik za oblast kliničke farmacije na Farmaceutskom fakultetu Univerziteta u Kragujevcu, 2008.
4. Stanimirović V. (ur.) i sar.: Farmakoterapijski vodič 4, Agencija za lekove i medicinska sredstva Srbije- pomoćni udžbenik na Farmaceutskom fakultetu u Beogradu, 2008.
5. Bukarica-Gojković Lj. i sar.: Praktikum iz farmakologije, Medicinski fakultet, Univerzitet u Beogradu, 2009.
6. Rang H. P., Dale M. M., Ritter J. M., Moore P. K.: Farmakologija, udžbenik, Data Status, Beograd, 2004.
7. Јаковљевић В., Сабо А., Томић З. (ур.), Стевић С. и сар.: Лекови у промету 2009, приручник о лековима и њиховој примени, АТЦ класификација, Нови Сад, Београд, Ниш, К. Митровица, Подгорица, Ortomedics, Нови Сад, 2009.

Literature in English:

8. Nurse Academy: Dosage Calculations for Nursing Students: A Complete Step-by-Step Guide for Quick Drug Dosage Calculation, Dosing Math Tips & Tricks for Students, Nurses, and Paramedics, Kindle Edition, London, 2021.
9. Whalen K.: Lippincott Illustrated Reviews: Pharmacology, Wolters Kluwer Health, London, 2018.
10. Adams M. P., Holland N.: Pharmacology for Nurses: A Pathophysiologic Approach, textbook, Pearson, New York, 2016.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, exercises, video presentations, demonstrations, workshop, case studies.

Grading (maximum 100 points)			
Pre-Exam obligations	**Points**	**Final Exam**	**Points**

Lecture attendance	3	Exam	30
Activity	7		
Seminar paper	0		
Exercises/professional practice	40		
Colloquiums	20		

PUBLIC HEALTH

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Public Health**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, second semester
ECTS:	5
Requirement:	no

Course objective:

The objective of the course is to train students to recognize values and determinants, duties of individuals, family, local community and society aimed at health protection, to recognize the role of nurses in health promotion, to familiarize them with the national project of health promotion and prevention of chronic diseases and strategies of European health care policies. The objective of the course is to familiarize students with the principles of healthy, safe and balanced nutrition of healthy and sick persons, with organization and activities in health care education in Serbia and to teach them to implement applicative theory in practice.

Course outcome:

Upon the completion of the course students will be able to recognize health-related factors, to recognize the role of therapist in health promotion, to make difference between health care education and health promotion, to practically apply the acquired knowledge.

Course content:

Lectures

Societal aspects of health; promotion of health and its characteristic; health promotion activities; impact on the health of individual; impact of nutrition on health; national project of promotion of health and chronic diseases; role of therapist in health improvement; 21st Century Health for All Strategy; objectives and purpose of health care education; levels and approaches to health care education; health care education in the process of nursing of the old; forms and methods of work in health care education; devices and equipment; areas of work in health care education; motivation and communication in health care education; teaching methods and its tasks; content of education; organization of lessons and preparation of health care educator for classes; principles of healthy nutrition, guidelines for healthy nutrition; development and definition of social medicine; social care of health; communication in health care; health care policy; social inequalities in health care system and obtaining health protection, levels of health protection; health protection systems globally; criteria for evaluation of socio-medical importance of health issues; marginalized population categories; role of health care institutions and medical professionals in health care system.

Exercises

Societal aspects of health. Promotion of health and its characteristics. Health promotion activities. Impact of health on individual. Impact of nutrition on health. Nutrition characteristic for healthy and sick individual. National project of health promotion and prevention of chronic diseases. Role of therapist in health improvement. 21st Century Health for All Strategy. Objectives and purpose of health care education. Levels and approaches in health care education. Health care education in the process of nursing of the old. Forms and methods of work in health care education. Devices and equipment. Areas of work in health care education. Motivation and communication in health care education. Teaching methods and its tasks. Content of education. Organization of lessons and preparation of health care educator for classes. Principles of healthy nutrition; food pyramid; guidelines for healthy nutrition. Development and definition of social medicine. Social care of health. Communication in health care. Health care policy. Social inequalities in health care system and obtaining health protection, levels of health protection. Health protection systems globally. Criteria for evaluation of socio-medical importance of health issues. Marginalized population categories. Role of health care institutions and medical professionals in health care system.

Literature:

Literature in Serbian:

1. Lazarević A. i sar.: Javno zdravlje, socijalna politika i zdravstvena zaštita, udžbenik, Beograd, Visoka zdravstvena škola strukovnih studija, Beograd, 2016.
2. Lazarević A.: Socijalna medicina, autorsko izdanje, Beograd, 2015.
3. Simić S. i sar.: Socijalna medicina, udžbenik, Medicinski fakultet, Beograd, 2012.
4. Hojer S.: Pristupi i metode u zdravstvenom odgoju, udžbenik, Koledž zdravlja, Ljubljana, 2005.

Literature in English:

5. Mossialos E., Permanand G., Baeten R., Hervey T.: Health systems governance in Europe: the role of European Union law and policy, Cambridge University Press, 2010.
6. Morrisey M. A.: Health Insurance, Health Administration Press, London, 2007.
7. Schneider M. J.: Introduction to Public Health, textbook, Jones-Barlett learning, New York, 2021
8. Murphy F.: Community Engagement, Organization, and Development for Public Health Practice, Springer Publishing Company, New York, 2004.

Number of classes:

Lectures	Exercises	Other classes	Study research work	Other forms of teaching

		(professional practice...)	(Degree Paper...)	(individual work with student, projects…)
30	30	0	0	0
Methods of teaching: lectures, exercises, discussions, problem solving				
Grading (maximum 100 points)				
Pre-Exam obligations		**Points**	**Final Exam**	**Points**
Lecture attendance		3	Exame	40
Activity		7		
Projects/Seminars		0		
Exercises/professional practice		20		
Colloquiums		30		

QUALITY CONTROL

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Quality Control**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	third year, sixth semester
ECTS:	5
Requirement:	no

Courses objective:
The objective of the course is to familiarize students with basic principles of organization of health care institutions and health care sector, manner of institution management, specific characteristics of decision-making process in health care sector, motivation and team building, features of intra-sectoral communication in health care institutions, human-resource matters and human-resources building, specific features of operating policy and planning strategy, administrative procedures and change management in health care institutions, mandatory and other forms of health insurance.

Course outcome:
Students who complete the course are trained to organize medical teams, ensure good communication within a health care institution, efficiently make decisions in situations when there is not enough time and efficiently manage changes; students understand systems of mandatory and other forms of health protection.

Course content:
Lectures
The role of good communication; the role of managers, difference between commanding and leading; policy and schedule of employment, introduction process, interview and integration of new employee; training; health care institution organization; primary, secondary and tertiary health protection; quality control procedures, importance of the notion of procedure; population protection from infectious diseases; production and trade in drugs – control; production and trade in narcotics – control; ban on the sale of alcoholic beverages, smoking ban, ban on advertising sale of tobacco products – control; chambers of health care practitioners; republic administration bodies in the sphere of environment protection; environmental legislature – control; protection of nature, environment protection, republic administration bodies in the sphere of health care; trade in explosive materials, inflammable substances and gases; medical waste and biological material management – control; inspection supervision; experiences of the EU countries; modern trends; current challenges in health care institutions; safety of medical practitioners, terrorism – control mechanisms.
Exercises
Discussion on organization of health care processes, health care institutions and health care insurance. Analysis of practical experience in Serbia and abroad. Analysis of practical examples in the domain of environment protection. Analysis and practical examples in the sphere of ban on smoking and alcohol. Analysis and discussion: environment protection. Analysis and discussion; medical waste and biological material disposal process in the area of health care. Safety of health care professionals, terrorism – discussion.

Literature:
Literature in Serbian:
1. Kancir D., Antić Z.: Menadžment kvaliteta, Beogradska poslovna škola - Visoka škola strukovnih studija, Beograd, 2013.
2. Blešić I.: Menadžment kvaliteta u turizmu i hotelijerstvu, Prirodno-matematički fakultet, Novi Sad, 2017.
3. Legetić B.: Principi menadžmenta, udžbenik, Ekonomski fakultet, Subotica, 2007.
4. Milović Lj.: Organizacija zdravstvene nege sa menadžmentom, udžbenik, Naučna knjiga, Beograd, 2004.
5. Marinković Lj: Menadžment u zdravstvenim organizacijama, G.A.D. Beograd, 2001.
6. Mićović P.: Zdravstveni menadžment, Obeležja, Beograd, 2008.
Literature in English:
7. Spath P.: Applying Quality Management in Healthcare: A Systems Approach, textbook, Health Administration Press, Boston, 2017.
8. Swanwick T., Vaux E.: ABC of Quality Improvement in Healthcare, Villey, New York, 2020.
9. Probbins S., Judge T.: Organizaciono ponašanje, Mate, Zagreb, 2009.
10. Beik Janet I.: Health Insurance Today: A Practical Approach, Saunders, Philadelphia, 2010.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, case study, discussion, workshop, e-learning

Grading (maximum 100 points)

Pre-Exam obligations	Points	Final Exam	Points
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

RADIATION PRODUCING (ROENTGEN) APPARATUS AND DEVICES

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Radiation Producing (Roentgen) Apparatus and Devices**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	second year, third semester
ECTS:	8
Course:	Radiology Physics and Basics of Radiology work Methods

Course objective:
Acquisition of knowledge on Roentgen equipment and devices, their parts and functions, as well as on the way they are used.

Course outcome:
Upon the completion of the course, students should: acquire knowledge on Roentgen device and equipment that may be applied in practice; be familiar with Roentgen devices and equipment, their parts and functions they have; be familiar with the basic technique of using Roentgen devices and equipment and their use for diagnostic purposes; be able to explain physical and technical principles of computerized tomography, magnetic resonance imaging, nuclear medicine techniques (PET and SPECT devices) and use of ultrasound devices, as well as to put the given principles in correlation with principles of patient protection, image quality and artefacts; be able to understand and give a critical opinion on factors affecting the quality of radiographic image; to understand how to read and interpret use instructions and accompanying documentation on Roentgen devices and equipment; to understand the correlation between exposition parameters and types of examination or size of patient; to understand how and why different factors affect the quantity of secondary radiation and discuss their impact on the image quality and radiation dose; and be able to adjust parameters of the Roentgen and computerized tomography to the method of examination.

Course content:
Lectures:
History of Roentgen devices; Modern Roentgen pipes; The hood and pipe cooling; Roentgen apparatus generators; Control desk and automatic exposition control; Radiology stands: standard and special; Radioscopy and obtaining image on screens; Remote control devices, mobile, mammography, stomatology etc.; Angiography devices and equipment in angiography rooms. Computerized tomography scanning device, single-slice and multi-slice; Magnetic resonance device; Diagnostic ultrasound equipment; Digital radioscopy, FLAT-PANEL detectors; DICOM-standard and computer communication networks; Mutual comparison of similar radiology techniques, method selection; Computerized tomography, magnetic resonance, mammography, ultra sound; Nuclear medicine technology.
Exercises:
Exercises are compatible with theoretical classes and imply practice and demonstrations in the teaching base. Getting familiar with and operating certain Roentgen devices and equipment, proper use and handling. Introduction into practical work with mammography device, craniography device, remote-control devices, mobile devices, dental medicine Roentgen devices etc. Operation technique, use of radioscopy and production of various images. Getting familiar with and practical work with computerized tomography scanning device, magnetic resonance device and diagnostic ultrasound device. Practical work with angiography device and other angiography room devices.

Literature:
Literature in Serbian:
1. Milanović, M.: Rendgen aparati i uređaji za dijagnostiku, udžbenik, Visoka medicinska škola, Beograd, 2003.
2. Živković M.: Klinička radiologija 1, udžbenik, Sportska knjiga, Beograd, 2000.
3. Milanović M.: Rendgen aparati i uređaji, udžbenik, autorsko izdanje, Beograd, 2012.
Literature in English:
4. Douglas McGregor, J. Kenneth Shultis: Radiation Detection, Concepts, Methods, and Devices, CRS, London, 2020.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	75	240	0	0

Methods of teaching:
lectures, exercises, video presentations, demonstrations.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	30		
Colloquiums/exam	30		

RADIATION PROTECTION

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Radiation Protection**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	first year, second semester
ECTS:	8
Requirement:	no

Course objective:
Familiarization with pathogenesis, biological characteristics and consequences of ionizing radiation effects on health of population and professional exposed to it.

Course outcome:
Upon the completion of the course students will be: able to understand and use or seek advice on protection measures, understand which measures and equipment are to be used for ionizing radiation protection in living and working environment: self-protection of radiology clinical practice personnel, patient protection etc. in accordance with the law and ALARA principle; be familiar with legal regulations on activities relating to sources of ionizing radiation in medicine; discuss and state critical opinion on topics such as examination of reproductive age women, of children, supplementary images etc.; able to explain different types of dosimeters and principles of functioning of gas, scintillation and semi-conductive detectors; able to explain and describe interaction between radiation and tissues or DNA depending whether the interaction is direct or indirect; able to explain and describe DNA structural changes and cell regeneration mechanisms; able to explain in what way biological effects of radiation (degree of injury) depend on factors such as linear energy transmission, dose, presence of oxygen and internal factors of radiated cell, such as mitotic index, degree of differentiation, cell cycle stage etc.; able to explain the connection of classification into stochastic and deterministic effects with radiology; able to explain the sensitivity of different cells to radiation, as well as the notions of absorbed, effective and equivalent dose on the basis of different effects of radiation on biological tissue; and able to explain injuries of different organ systems due to radiation and different symptoms of radiation poisoning.

Course content:
Lectures:
Matter structure; Radiation; Sources and characteristics of ionizing radiation; Difference between ionizing and non-ionizing radiation; Radiation – matter interaction; Biological characteristics of parts of ionizing radiation; Acute radiation syndrome; Nuclear accidents; Acute and chronic effects of ionizing radiation on different organs at intentional use of radiation; Examples of accidental (unintentional) exposure to radiation, present-time risks; Radiotoxicology; Biological injuries as a consequence of ionizing radiation exposure; Radiation doses that may occur when using medical equipment; Radiation doses in relation to radiation exposure time; Notion of accelerated retirement; Regulations in Serbia, the region, international regulations; Legal regulations in Serbia and international regulations relating to radiation and protection measures; Possible applications of radiation in society and living environment and possible risks when applying different radiation forms.
Exercises:
Exercises are compatible with theoretical classes and imply practice and demonstrations in the teaching base, Control of sources of ionizing radiation in living environment. Dosimetry. Control of sources of ionizing radiation in diagnostic radiology wards and in nuclear medicine. Protection of patients and personnel from ionizing radiation in diagnostic radiology wards, radiotherapy wards and in nuclear medicine.

Literature:
Literature in Serbian:
1. Jovanović T., Paunović K.: Osnovi radiološke zaštite, udžbenik, Visoka medicinska škola, Beograd, 2005.
2. Marković S., Spaić R.: Zdravlje i društvo, Zavod za biomedicinsko inženjerstvo i medicinsku fiziku SR Jugoslavije, Beograd, 2001.
3. Dodig D. i sar.: Radijacijske ozljede, Medicinska naklada, Zagreb, 2002.
Literature in English:
4. Dance D. R., Christofides S., Maidment A. D. A., McLean I. D., Ng K. H (eds.): Diagnostic Radiology Physics: a Handbook for Teachers and Students, International Atomic Energy Agency, Vienna, Austria, 2014.

Number of classes:

Lecture	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
45	30	30	0	0

Methods of teaching:
Lectures, exercises, video presentations, simulations, demonstrations, case analysis, clinical practice.

Grading (maximum 100 points)			
Pre-Exam obligations	**Points**	**Final Exam**	**Points**

Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	30		
Colloquiums/exam	30		

RADIOLOGY PHYSICS AND BASICS OF RADIOLOGY WORK METHODS

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Radiology Physics and Basics of Radiology Work Methods**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	first year, first semester
ECTS:	5
Requirement:	no

Course objective:
The objective of the course is that students understand basics of the methods of work in radiology and consequently to understand principles of operation of devices and techniques in radiology, methods of nursing in radiology and methods of radiation protection of patients and medical professionals.

Course outcome:
Upon the completion of the course student will: to acquire basic knowledge and skills in radiology physics required for quality application of radiation in medicine; to understand basics of methods of work in radiology; to understand principles of operation of devices and techniques in radiology; to understand methods and principles of patient nursing in radiology; to understand methods of radiation protection.

Course content:
Lectures:
Elementary physical quantities. International unit system; measurement, measurement instruments, standards, types of errors. Measurement errors. Electrostatics (electrostatic measurements and laws). Electric power, elements of circuits. Basics of magnetism (nature and quantities). Basic measurement instruments in electric engineering. Wave mechanics: mechanical and and electromagnetic waves. Electromagnetic radiation: properties, elementary physical quantities. Planck's law, matter and energy equivalence. Atomic structure of matter: elementary particles and their properties, Bohr-Rutheford atomic model, Bohr's postulates, atomic excitation, spectres and atomic spectroscopy. Molecular properties: chemical bonds, excitation forms. Crystals: properties. Luminiscence, fluorescence, phosphoroscence, ionization. Atomic nucleus: properties, nuclear forces. Elementary physical quantities in radiology. Radioactivity, radioactive elements in nature, artificial radioactivity. Radioactive disintegration law. Nature, characteristics and origin of Röntgen radiation. Basic characteristics of ionizing radiation, effects on matter, absorption of x-ray and gamma-ray radiation. Interaction of ionizing radiation and matter. Radiation doses and dosimeters. X-ray tube: structure, properties, classification, application. Filters. Radiation output. X-ray devices. Principle of application of X-ray radiation in radiation therapy. Principle of X-ray radiation switch in radiation therapy. Basics of nuclear medicine, therapy, Basics of radiation protection. Basic principles of application of ultrasound in medicine. Radiology as a science. History of radiology worldwide and in Serbia. Radiology wards. Patient monitoring in radiology. Anaphylactic reaction.
Exercises:
Division of electromagnetic radiation by energies. Assignments: matter defect, bond energy, alpha, beta and gamma radioactive disintegration law, radiation doses. Practical familiarizing with dosimeter functioning. Familiarizing with diagnostic X-ray devices: image receives, image quality, computerized tomography, mammography. Application of X-rays in radiation therapy. Brachytherapy. Ultrasound diagnostic. Communication and first contact with patient in radiology. Radiology ward planning. Elementary physical quantities in radiology. Radioactivity, radioactive elements in nature, artificial/induced radioactivity. Radioactive disintegration law. Nature, characteristics and origin of X-ray radiation. Basic characteristics of ionizing radiation on matter, absorption of X-ray and gamma-ray radiation.

Literature:
Literature in Serbian:
1. Simonović J., Vuković J., Ristanović D., Radovanov R., Popov D.: Biofizika u medicini, II izd., udžbenik, Medicinska knjiga, 2003.
Literature in English:
2. Walter Huda: Review of Radiologic Physics, LWW, New York, 2016.
3. Andrea S. Doria, George Tomlinson, Joseph Beyene, Rahim Moineddin: Research Methods in Radiology: A Practical Guide, Thieme, Amsterdam, 2014.

Number of classes (in semester):

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
15	60	0	0	0

Methods of teaching:
lectures, exercises, video presentation, e-learning, demonstration.

Grading (maximum 100 points)			
Pre-Exam obligations	**Points**	**Final Exam**	**Points**

Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

RARE DISEASES

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Rare Diseases**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	second year, fourth semester
ECTS:	5
Requirement:	no

Course objective:
The objestive of the course is to acquaint students with the concept and types of rare diseases, the ways in which the health system helps patients with rare diseases, as well as the challenges in this area, in Serbia as well as in the other countries.

Course outcome:
After the course, the student should be acquainted with the concept and types of rare diseases, ways in which the health system can help patients with rare diseases, as well as the challenges that arise in this area, both in Serbia and in other countries.

Course content:
Lectures
The notion of a rare disease; characteristics of rare diseases in Serbia and worldwide; the list of rare diseases and genes affecting their occurrence; the methodology with data on rare diseases in Serbia; burden born by stationary health-care institutions in Serbia, distribution of rare diseases globally; malignant tumors in children; challenges in fighting rare diseases in Serbia and globally, propositions of measures in Serbia; Zoja's Law; NORBS; the list of orphan drugs in all phases of their development, from Europen Medicines Agency labeling relating to medicines for treatment of rare diseases to obtaining permit for the European market; "assistance in diagnosis" option as na option of conducting tests according to disease signs and symptoms; recommendations and guidelines in case of urgent medical intervention and anaesthesia; overview of sites specialized in rare diseases in every country through Orphanet; directions of present research in rare diseases.
Exercises
The notion of a rare disease; characteristics of rare diseases in Serbia and worldwide; Zoja's Law; NORBS – discussion; discussion on rare diseases and challenges faced by patients in Serbia and worldwide.

Literature:
Literature in English:

1. Claudia Gonzaga-Jauregui, James R. Lupski: Genomics of Rare Diseases: Understanding Disease Genetics Using Genomic Approaches, Academic Press, London, 2022.
2. Robert M. Kliegman, Brett J. Bordini: Undiagnosed and Rare Diseases in Critical Care, An Issue of Critical Care Clinics, E-book, 2021.

Literature in Serbian:

3. interni material predavača
4. Ministarstvo zdravlja Republike Srbije: Program za retke bolesti u Republici Srbiji za period 2020-2022. godine: https://www.zdravlje.gov.rs/tekst/343045/program-za-retke-bolesti-i-akcioni-plan.php
5. Ministarstvo zdravlja Republike Srbije: Lista retkih bolesti i gena uključenih u njihov nastanak, kao i enciklopedija retkih bolesti i njihova klasifikacija izvedena iz objavljenih stručnih klasifikacija: https://www.orpha.net/consor/cgi-bin/Disease.php?lng=EN
6. Ministarstvo zdravlja Republike Srbije: Popis „orphan" lekova (lekova siročića), u toku svih faza njihovog razvoja, od oznake Evropske Medinske Agencije koja se odnosi na lekove namenjene lečenju retkih bolesti do dobijanja dozvole za evropsko tržište https://www.orpha.net/consor/cgi-bin/Drugs.php?lng=EN
7. Ministarstvo zdravlja Republike Srbije: Opcija "pomoć pri dijagnozi" omogućava korisnicima pretragu prema znacima i simptomima bolesti https://www.orpha.net/consor/cgi-bin/Disease_HPOTerms.php?lng=EN
8. Ministarstvo zdravlja Republike Srbije: Preporuke i smernice u slučaju hitne medicinske intervencije i anestezije https://www.orpha.net/consor/cgi-bin/Disease_Emergency.php?lng=EN

Number of classes:

Theoretical lectures	**Theoretical exercises**	**Professional practice**	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures and practical exercises with anatomical and hystological devices, use of atlas, video projections, computer animations and simulations of physiological processes

Grading (maximum 100 points)

Pre-Exam commitments	Points	Final Exam	Points
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums	30		

RESEARCH METHODOLOGY

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Research Methodology**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	third year, sixth semester
ECTS:	5
Requirement:	no

Course objective:
Training in research work.

Course outcome:
Possession of knowledge necessary for research work.

Course content:
Lectures
Importance of scientific work. Difference between scientific and professional work. Stages of research work. Selection of topic. Bibliography. Ways of literature citation. Experiment. Survey and survey results processing, protection of data. Statistical data processing. Quality of the sample. Objectivity and subjectivity. Result and conclusion. Scientific paper structure and writing. Types of scientific paper. Valuation of scientific paper. Ways of scientific paper publishing. Citation. Plagiarism. Protection of data.
Exercises
Techniques of collecting, organizing and studying literature. Searching selected databases. Processing of research results. Graphic presentation of data. Writing scientific paper. Literature citation. Drawing up seminar paper.

Literature:
Literature in Serbian:
1. Milankov V., Jakšić P.: Metodologija naučno-istraživačkog rada u biološkim disciplinama, udžbenik, Prirodno-matematički fakultet, Univerzitet u Novom Sadu, Novi Sad, 2006.
2. Šomođi Š., Novković N., Kraljević-Balalić M., Kajari K.: Uvod u naučni rad, udžbenik, Poljoprivredni fakultet, Univerzitet u Novom Sadu, Novi Sad, 2004.

Literature in English:
3. Ebel H. F., Bliefert C., Russey W. E.: The art of scientific writing, Wiley-VCH, Verlag GmbH & Co. KgaA, Weinheim, 2004.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
Lectures, exercises, discussions, e-learning, workshop, seminar paper, public presentation.

Grading (maximum 100 points)

Pre-Exam commitments	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	40
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	20		
Colloquiums/exam	30		

ROENTGEN ANATOMY AND RADIOGRAPHIC TECHNIQUES

Study program:	Radiology
Type and level of study:	undergraduate proffesional studies
Course:	**Roentgen Anatomy and Radiographic Techniques**
Language of instruction:	Serbian
Course status:	mandatory
Semester:	first year, second semester
ECTS:	12
Requirement:	Anatomy and Physiology

Course objective:
The objective of the course is acquisition of knowledge in Roentgen anatomy of thoracic and abdominal organs, on healthy person examination results and basic pathological findings. In the part of the course dealing with radiographic techniques, the objective is acquisition of knowledge on radiographic positions of the skeletal system, lungs and heart, abdominal and urinary tract X-rays, as well as on the projection of anatomy details and basic pathological findings.

Course outcome:
Acquisition of practical knowledge in Roentgen anatomy of thoracic and abdominal organs. On the basis of the acquired theoretical knowledge in Roentgen anatomy, the outcome of the part of the course dealing with radiographic techniques is the acquisition of knowledge and skills to practically perform basic radiographic techniques, evaluation of appropriateness of radiographic positions, identification of anatomic details and elementary pathological processes.

Course content:
Lectures:
Radiological anatomy; Specific features of patient imaging (in bed, on stretcher), imaging in surgical theater. Chest and cardiac radiography (front, lateral, tilted postures), chest upper part, proving minor effusions; Radiological anatomy and primary pathological findings; Radiographic positions – digestive tract imaging (salivary gland, oesophagus, abdominal area imaging), hepatopancreatic region and urogenital system (plain XR).
Familiarizing with different radiographic technologies and techniques used in radiographic imaging, as well as with the development of varios modalities within the same medical imaging and diagnostics; advantages and shortcomings of alternative solutions. Directions of development of radiographic techniques; Radiographic postures; basic elements, centering, orientational points and lines, postures, marks on film; Methods of examination of the skeletal system (scopy, graphy, teleradiography, macrography); Skeletal constitution, characteristics of the skeletal system in children and adults; Indications, variations and elementary pathological findings; Standard and special radiography of the head, vertebral column, thorax, upper and lower extremities.
Exercises:
Exercises are compatible with lectures and theoretical unit and they include practical work and demonstrations in the teaching base.

Literature:
Literature in Serbian:
1. Živković M.: Klinička radiologija 1, udžbenik, Sportska knjiga, Beograd, 1992.
Literature in English:
2. Wicke L., Firbas W., Schmiedl R.: Atlas of Radiologic Anatomy, 4th ed., Munich, Baltimore: Urban & Schwarzenberg, Marryland, 1987.
3. Möller T. B., Reife E.: Pocket Atlas of Sectional Anatomy: Computed Tomography and Magnetic Resonance Imaging, Vol. 1: Head and Neck, 3rd ed., Thieme, Stuttgart, 2007.
4. Carlton R., Adler A.: Principles of Radiographic Imaging, Delmar Thomson Learning, New York, 2001.
5. Fauber T. L.: Radiographic Imaging & Exsposure, Mosby Elsevier, St. Louis, 2009.

Number of classes:

Lecture	Exercises	Other classes (professional practice...)	Study research work (Degree Paper...)	Other forms of teaching (individual work with student, projects…)
45	60	300	0	0

Methods of teaching:
lectures, exercises, video presentation, simulations, demonstrations, case analysis, clinical practice.

Grading (maximum 100 points)

Pre-Exam obligations	Points	Final Exam	Points
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	30		
Colloquiums/exam	30		

SPECIALIZED ENGLISH FOR MEDICINE1

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Specialized English for Medicine 1**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, first semester
ECTS:	5
Requirement:	no

Course objective:
Course objective is familiarization with characteristics of the English language, adoption of phrases and patterns necessary for communication at professional level and adoption of techniques of written and oral expressing in professional communication.

Course outcome:
Students will be able to apply the acquired knowledge in professional communication, create corresponding written forms in accordance with their professional communication and use speech patterns appropriate to a given situation.

Course content:
Lectures
Grammar: English alphabet, basic reading and writing rules, greeting, personal pronouns, possessive pronouns, present tenses, gender and number of nouns, colors, interrogative and affirmative sentences; aspects of everyday life in English-speaking countries; prepositions with dative and accusative, the imperative, modal verbs, perfect tenses, clause framework; specialist texts in connection with students´ future profession, specialist terminology, examples of commercial, specialist texts from practice; examples of documents students will deal with in practice.
Exercises
Students practice everyday situation dialogues (giving/understanding orientation instructions, retelling happenings, making plans, scheduling meetings, giving descriptions, reporting etc.); understanding texts on everyday life situations (e. g. advertisements), they expand vocabulary relating to their environment, family, job.

Literature:
Literature in Serbian:
1. Dragović R.: Engleski za zdravstvene radnike, udžbenik, Naučna knjiga, Beograd, 2004.

Literature in English:
2. MacLean J.: English in Basic Medical Science, Oxford University Press, Oxford, 2000.
3. Turner S. Y., Sefika K. (ed.): Medical English for International Doctors and Nurses: How to communicate with your patients and colleagues effectively in English, textbook, Kindle Edition, London, 2015.
4. Murphy R.: English Grammar in Use, Cambridge University Press, Cambridge, 2014.
5. McCarthy M., O'Dell F.: English Vocabulary in Use, Cambridge University Press, Cambridge, 2006.
6. Hornby A.S.: Oxford Advanced Learner's Dictionary of Current English, Oxford University Pres, Oxford, 2008.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, practical exercises, communication, e-learning.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Seminar paper	0		
Exercises/professional practice	40		
Colloquiums	20		

SPECIALIZED ENGLISH FOR MEDICINE 2

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Specialized English for Medicine 2**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	second year, third semester
ECTS:	5
Requirement:	Specialized English for Medicine 1

Course objective:
Course objective is familiarization with characteristics of the English language, adoption of phrases and patterns necessary for communication at professional level and adoption of techniques of written and oral expressing in professional communication.

Course outcome:
Students will be able to apply the acquired knowledge in professional communication, create corresponding written forms in accordance with their professional communication and use speech patterns appropriate to a given situation.

Course content:
Lectures
Grammar: comparison of adjectives; causal clauses, future tense, preterite, conditional sentences, verbs of movement, active and passive voice; aspects of everyday life in English speaking countries: holiday, family life, education, life in city; relative clauses, verbs with prepositions, adjective forming suffixes and prefixes, deepening knowledge on dependent clauses; everyday life, business life and media in English speaking countries; specialist terminology relevant for students´ future profession, grammatically and linguistically more complex texts; work material corresponding to everyday practice at work.
Exercises
Students practice how to express themselves orally and in writing on everyday life topics, such as free time, job, media, fashion, politics; they practice shorter discussions and stating their opinion, asking others on their views and pointing to opposite aspects of different views.

Literature:
Literature in Serbian:
1. Dragović R.: Engleski za zdravstvene radnike, udžbenik, Naučna knjiga, Beograd, 2004.

Literature in English:
2. MacLean J.: English in Basic Medical Science, Oxford University Press, Oxford, 2000.
3. Turner S. Y., Sefika K. (ed.): Medical English for International Doctors and Nurses: How to communicate with your patients and colleagues effectively in English, textbook, Kindle Edition, London, 2015.
4. Murphy R.: English Grammar in Use, Cambridge University Press, Cambridge, 2014.
5. McCarthy M., O'Dell F.: English Vocabulary in Use, Cambridge University Press, Cambridge, 2006.
6. Hornby A.S.: Oxford Advanced Learner's Dictionary of Current English, Oxford University Pres, Oxford, 2008.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, practical exercises, communication, e-learning.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums	20		

SPECIALIZED GERMAN FOR MEDICINE 1

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Specialized German for Medicine 1**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	first year, first semester
ECTS:	5
Requirement:	no

Course objective:
Course objective is familiarization with characteristics of the German language, adoption of phrases and patterns necessary for communication at professional level and adoption of techniques of written and oral expressing in professional communication.

Course outcome:
Students will be able to apply the acquired knowledge in professional communication, create corresponding written forms in accordance with their professional communication and use speech patterns appropriate to a given situation.

Course content:
Lectures
Grammar: German alphabet, basic reading and writing rules, greeting, personal pronouns, possessive pronouns, present tenses, gender and number of nouns, colors, interrogative and affirmative sentences; aspects of everyday life in German-speaking countries; prepositions with dative and accusative, the imperative, modal verbs, perfect tenses, clause framework; specialist texts in connection with students´ future profession, specialist terminology, examples of commercial, specialist texts from practice; examples of documents students will deal with in practice.
Exercises
Students practice everyday situation dialogues (giving/understanding orientation instructions, retelling happenings, making plans, scheduling meetings, giving descriptions, reporting etc.); understanding texts on everyday life situations (e. g. advertisements), they expand vocabulary relating to their environment, family, job.

Literature:
Literature in Serbian:
1. Menschen A1 KB und Menschen A1 AB, udžbenik (video materijal: http://matifmarin.blogspot.rs/p/menschen-film-stationen-clips.html), Klett Verlag, Stuttgart, 2018.
2. Nikolovski V.: Gramatička vežbanja „Eine kleine Übungsgrammatik“, Zavod za udžbenike i nastavna sredstva, Schritte international 1, Grammatikspiele.

Literature in English:
3. Pude E. A., Specht F.: Menschen, Deutsch als Fremdsprache Kursbuch mit DVD-ROM, udžbenik, Hueber Verlag, Munchen, Deutschland, 2012.
4. Loibl B. et all.: Schritte Plus im Beruf, Kommunikation am Arbeitsplatz, Max Hueber Verlag, Ismaning. Deutschland, 2015.
5. Becker N., Braunert J.: Alltag, Beruf, Kursbuch+Arbeitsbuch, Max Hueber Verlag, Ismaning, 2009.
6. Becker N., Braunert J., Schlenker W.: Unternehmen Deutsch Grundkurs. Kursbuch, Klett Verlag, Stuttgart, 2005.
7. Becker N., Braunert J.: Unternehmen Deutsch Grundkurs, Arbeitsbuch, KlettVerlag, Stuttgart, 2004.
8. https://www.hueber.de/seite/pg_lernen_lerner_dvd_mns, knjiga i link.
9. https://www.hueber.de/seite/pg_lernen_uebungen_mns, dodatne on line vežbe.
10. Grammatik - Ganz klar Übungsgrammatik A1-B1, uz audio materijal, Hueber Verlag, kratak pregled gramatike sa vežbanjima „Hallo aber Deutsch“.
11. www.schubert.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, practical exercises, communication, e-learning.

Grading (maximum 100 points)

Pre-Exam obligation	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exrcises/professional practice	40		
Colloquiums	20		

SPECIALIZED GERMAN FOR MEDICINE 2

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	**Specialized German for Medicine 2**
Language of instruction:	English, Serbian
Course status:	elective
Semester:	second year, third semester
ECTS:	5
Requirement:	Specialized German for Medicine 1

Course objective:
Course objective is familiarization with characteristics of the English language, adoption of phrases and patterns necessary for communication at professional level and adoption of techniques of written and oral expressing in professional communication.

Course outcome:
Students will be able to apply the acquired knowledge in professional communication, create corresponding written forms in accordance with their professional communication and use speech patterns appropriate to a given situation.

Course content:
Lectures
Grammar: comparison of adjectives; causal clauses, future tense, preterite, conditional sentences, verbs of movement, active and passive voice; aspects of everyday life in German-speaking countries: holiday, family life, education, life in the city; relative clauses, verbs with prepositions, adjective forming suffixes and prefixes, deepening knowledge on dependent cluases; everyday life, business life and media in English speaking countries; specialist terminology relevant for students´ future profession, grammatically and linguistically more complex texts; work matrial corresponding to everday practice at work.
Exercises
Students practice how to express themselves orally and in writing on everyday life topics, such as free time, job, media, fashion, politics; they practice shorter discussions and stating their opinion, asking others on their views and pointing to opposite aspects of different views.

Literature:
Literature in Serbian:
1. Menschen A1 KB und Menschen A1 AB, udžbenik (video materijal: http://matifmarin.blogspot.rs/p/menschen-film-stationen-clips.html), Klett Verlag, Stuttgart, 2018.
2. Nikolovski V.: Gramatička vežbanja „Eine kleine Übungsgrammatik“, Zavod za udžbenike i nastavna sredstva, Schritte international 1, Grammatikspiele.

Literature in German:
3. Pude E. A., Specht F.: Menschen, Deutsch als Fremdsprache Kursbuch mit DVD-ROM, udžbenik, Hueber Verlag, Munchen, Deutschland, 2012.
4. Loibl B. et all.: Schritte Plus im Beruf, Kommunikation am Arbeitsplatz, Max Hueber Verlag, Ismaning. Deutschland, 2015.
5. Becker N., Braunert J.: Alltag, Beruf, Kursbuch+Arbeitsbuch, Max Hueber Verlag, Ismaning, 2009.
6. Becker N., Braunert J., Schlenker W.: Unternehmen Deutsch Grundkurs. Kursbuch, Klett Verlag, Stuttgart, 2005.
7. Becker N., Braunert J.: Unternehmen Deutsch Grundkurs, Arbeitsbuch, KlettVerlag, Stuttgart, 2004.
8. https://www.hueber.de/seite/pg_lernen_lerner_dvd_mns, knjiga i link.
9. https://www.hueber.de/seite/pg_lernen_uebungen_mns, dodatne on line vežbe.
10. Grammatik - Ganz klar Übungsgrammatik A1-B1, uz audio materijal, Hueber Verlag, kratak pregled gramatike sa vežbanjima „Hallo aber Deutsch“.
11. www.schubert.

Number of classes:

Lectures	**Exercises**	**Other classes** (professional practice...)	**Study research work** (Degree Paper...)	**Other forms of teaching** (individual work with student, projects…)
30	30	0	0	0

Methods of teaching:
lectures, practical exercises, communication, e-learning.

Grading (maximum 100 points)

Pre-Exam obligations	**Points**	**Final Exam**	**Points**
Lecture attendance	3	Exam	30
Activity	7		
Projects/Seminars	0		
Exercises/professional practice	40		
Colloquiums	20		