

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; **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	30	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		960	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
14c	rad-izb-03-e	Nutritionism	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-33	Basics of Nuclear Medicine	4	30	45	0	0	240	5	m	p
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-d̄	Rare Diseases	4	30	30	0	0	0	5	e	p
19d	rad-izb-04-z	Pharmacology and Drug Dosing	4	30	30	0	0	0	5	e	pa
19e	rad-izb-04-ž	Psychology in Nursing and Health Care	4	15	30	0	0	0	5	e	p
Total number of classes and ECTS per year:				330	345	0		1.020	60		

THE THIRD YEAR											
20	rad-20	Basics of Surgery with Orthopedics	5	30	15	0	0	0	10	m	pa
21	rad-17	Emergency Medicine and Nursing in Special Conditions	5	30	30	0	0	240	8	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	240	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	12	m	pa
25	rad-19	Modern Diagnostic Radiology Methods	6	60	60	0	0	300	10	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
26g	рад-изб-06-е	Clinical Nuclear Medicine	6	30	30	0	0	180	5	e	pa
26d	рад-изб-06-ж	Laboratory Nuclear Medicine	6	30	30	0	0	180	5	e	pa
26d	рад-изб-06-д	Basics of Integrative Medicine	6	30	30	0	0	0	5	e	p
Total number of classes and ECTS per year:				300	300	0		1.110	60		

Total number of classes and ECTS per all three years of studies:	1.875	3.090	180		
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COURSE CONTENT
(in alphabetical order as listed below)

Anatomy and Physiology
Allergology
Basics of Information and Communication Technologies
Basics of Integrative Medicine
Basics of Internal Medicine
Basics of Nuclear Medicine
Basics of Nursing
Basics of Oncology with Selected Sections from Radiotherapy and Nursing of Oncological Patients
Basics of Radiotherapy
Basics of Surgery with Orthopedics
Basics of Ultrasound Diagnostics
Business Communication Skills
Business English
Business German
Clinical Nuclear Medicine
Diagnostic Radiology
Emergency Medicine and Nursing in Special Conditions
Ethics in Health Care
First Aid
Geriatrics with Nursing in Geriatrics
Health Care and Social-Security Legislation
Human Resources Management in Health Care
Hygiene with the Basics of Microbiology
Interventional Vascular and Non-vascular Methods
Laboratory Nuclear Medicine
Marketing of Health Care Institutions
Mental Hygiene
Modern Diagnostic Radiology Methods
Nutritionism
Organization of Health Care Systems
Organization of Radiology Ward
Pathophysiology
Pharmacology and Drug Dosing
Psychology in Nursing and Health Care
Public Health
Quality Control
Radiation Producing (Roentgen) Apparatus and Devices
Radiation Protection
Radiology Physics and Basics of Radiology Work Methods
Rare Diseases
Research Methodology
Roentgen Anatomy and Radiographic Techniques
Specialized English for Medicine 1
Specialized English for Medicine 2
Specialized German for Medicine 1
Specialized German for Medicine 2

ALLERGOLOGY

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Allergology				
Language of instruction: 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: <i>Lectures</i> Objects, definition and tasks of allergology; respiratory allergy (rhinitis, rhinoconjunctivitis, 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. <i>Exercises</i> 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 and scientific institutions in Serbia in the field of allergology.				
Literature: <i>Literature in English:</i> 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. <i>Literature in Serbian:</i> 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	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, e-learning.				
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:	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 <i>Anatomy:</i> 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. <i>Physiology:</i> Human physiology study; transport through cell membrane; intercellular communication; excitation physiology; membrane potential of inactivity; action potential; nervous impulse transmission; skeletal muscle physiology; neuro muscular synapse; 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. Plasma buffer solution capacity. Coagulation. Discussion and analysis of selected physiological systems.
Literature:	<i>Literature in English:</i> 1. Scanlon V., Sanders T.: Essentials of Anatomy and Physiology, Kindle Edition, London, 2018 2. Netter F. H., Machado C. A. G.: Atlas of Human Anatomy & CD, ILS, Mala velika knjiga, Novi Sad, 2005. 3. Drake L. R., Wayne Vogl A., Mitchell A. W. M., et al.: Gray's Anatomy for Students, textbook, Elsevier, New York, 2014. 4. Arroyo J. P.: Back to Basics in Physiology, textbook, Academic Press, London, 2013. <i>Literature in Serbian:</i> 5. Stojić-Džunja Lj.: Anatomija za studente zdravstvene nege, udžbenik, Medicinski fakultet, Novi Sad, 2017. 6. Veličković D.: Fiziologija za studente farmacije, udžbenik, Medicinski fakultet, Niš, 2013. 7. Despopoulos A., Silbernagl S.: Fiziološki atlas u boji za studente medicine, Medicinski fakultet, Niš, 2007. 8. Mačvanin Đorđe: Anatomija, udžbenik, Fakultet za menadžment u sportu, Alfa univerzitet, Beograd, Matica srpska, Novi Sad, 2005. 9. Milisavljević M. i sar.: Klinička anatomija, udžbenik, Nauka, Beograd, 2004. 10. Guyton A.C., Hall J. E.: Medicinska fiziologija, 11. izdanje, Savremena administracija, Beograd, 2006. 11. Mujović i sar.: Medicinska fiziologija, udžbenik, Medicinski fakultet, Kosovska Mitrovica (Priština), 2008.
Number of classes:	

Lectures	Exercises	Other classes (professional practice...)	Study research work	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: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Biheller B. R., Evans J., Pinard T. K., Romer M. R.: Microsoft Office 2007: Introductory Course, textbook, Course Technology, Boston, 2007. <i>Literature in Serbian:</i> 2. Marčičević Ž., Marošani Z.: Primena informacionih tehnologija, udžbenik, Visoka poslovna škola strukovnih studija, Novi Sad, 2010. 3. Marošani Z., Vesin B.: Primena informacionih tehnologija, praktikum, Visoka poslovna škola strukovnih studija, Novi Sad, 2009. 4. Gerlič I.: Savremene informacione tehnologije u obrazovanju, udžbenik, Nacionalna izdavačka kuća Slovenija, Ljubljana, 2000. 5. Softver HELIANT za rad u zdravstvenoj ustanovi, demo verzija. 6. Bunzel T.: Microsoft Office 2010 Kao od šale, CET, Beograd, 2010. 7. Tasić M., Čirić M.: Osnovi informatike, udžbenik, Prirodno-matematički fakultet, Niš, 2002. 8. Milošević Z., Bogdanović D.: Statistika i informatika u oblasti medicinskih istraživanja, udžbenik, Medicinski fakultet Univerziteta u Nišu, Niš, 2012. 9. Ringstrom D.: Otkrijte skrivena blaga Mikrosoft Eksela, Kompjuter Biblioteka, Beograd, 2022. 10. Arsić S.: Želim da naučim Eksel, Beosing, Beograd, 2005.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0
Methods of teaching: lectures, work with real 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 INTEGRATIVE MEDICINE

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Basics of Integrative Medicine				
Language of instruction: Serbian				
Course status: elective				
Semester: third year, sixth semester				
ECTS: 5				
Requirement: no				
Course objective: The objective of the course is to provide students with basic information on different ideas and approaches to therapy, enable acquisition of knowledge on most important techniques included in the notion of integrative medicine, provide basic information on certain techniques of integrative medicine and provide preconditions for understanding the integrative approach to therapy. The objective of the course is that students understand integrative medicine as a medicine parallel, complementary to the conventional medicine that jointly result in an improved condition of the patient.				
Course outcome: Having passed the exam, the student will be capable of logical judgment on different approaches to therapy and treatment, approaches to therapy and treatment dealt with within integrative medicine, basic characteristics of certain methods; current application of different forms of integrative medicine in Serbia and global trends. In addition to that, students will be trained to interpret current laws of the Republic of Serbia relating to integrative medicine branches.				
Course content: <i>Lectures</i> Presentation of different concepts in defining the notions of conventional and integrative therapy, holistic and integrative approach to therapy; notions and technique presently classified as nonconventional therapy techniques; currently used therapeutic tools; basics of integrative medicine methods: acupuncture (acupressure, magnetotherapy, laser therapy), quantum medicine (Bi-Digital O-Ring Test, BRT, MRT), herbal and vitamin supplements, homeopathy, nonconventional approach to nutrition, essential oils, manipulative therapies (osteopathy, chiropractic), applied kinesiology, naturopathy, relaxation techniques (yoga, meditations, tai-chi, autogenic training, hypnosis etc.), massages (shiatsu, reflexotherapy), anthroposophic medicine, aromatherapy, colour therapy, smell therapy, sound therapy, crystal therapy, mud therapy, water therapy, qigong, reiki, environmental medicine; providing information on current and new forms of complementary therapies (information diagnostic and therapy); traditional medicine vs. integrative therapy; main assumptions of traditional medicine (acupuncture, tui na, herbal), campo, Indian (ayurveda), fundamentals of other traditional medicine; traditional systems of therapy in the Balkan region; safety at selection or use of complementary medicine methods. <i>Exercises</i> Visits to integrative medicine centres; familiarization with actual cases; discussion; case studies; internet presentations; field visits (to centres of certain integrative medicine branches).				
Literature: <i>Literature in English:</i> 1. Omura Yoshiaki: Practice of the Bi-Digital O-Ring Test, Ido No Nippon, Tokyo 1986. 2. Robson Terry: An introduction to Complementary Medicine, Allen & Unwin, Sydney, 2003. 3. Micozzi S. Marc: Fundamentals of Complementary and Alternative Medicine, Saunders, Philadelphia, 2010. 4. Kotsirilos Vicki, Vitetta Luis, Sali Avni: A Guide to Evidence-based Integrative and Complementary Medicine, Churchill Livingstone, Edinburgh, 2011. 5. Hecker Hans-Ulrich, Steveling Angelika, Peuker Elmar, Kastner Joerg: Color Atlas of Acupuncture: Body Points - Ear Points - Trigger Points (Complementary Medicine), Thieme, Amsterdam, 2008. 6. Sutton Amy L: Complementary and Alternative Medicine Sourcebook, Omnigraphics, Detroit, 2010. 7. Zhanwen Liu, Liang Liu: Essentials of Chinese Medicine, Springer, London, New York, 2009. 8. Kligler Benjamin, Lee Roberta: Integrative Medicine principles for practice, Program in Integrative Medicine, University of Arizona. McGraw-Hill Companies, New York, Chicago, London, Madrid, Milan, Sydney, Toronto, 2004. <i>Literature in Serbian:</i> 9. Grupa autora: Tajne alternativne medicine: Medicinska knjiga, Beograd, 2016. 10. Škokljević A.: Akupunkturologija, Naučna knjiga, Beograd, 2009. 11. Jovanović-Ignjatić Zlata: Kvantno hologramska medicina kroz prizmu akupunkturnih i mikrotalasno rezonantnih (samo) regulatornih mehanizama, Quanttes, Beograd, 2010.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0
Methods of teaching:				

interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, 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/exam	30		

BASICS OF INTERNAL MEDICINE

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Basics of Internal Medicine				
Language of instruction: 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: <i>Lectures</i> 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. <i>Exercisess</i> 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: <i>Literature in English:</i> 1. Farr C. B.: Internal Medicine for Nurses: Outlines of Internal Medicine for the Use of Nurses, Scholar's Choice, London, 2015. 2. Kasper D., Fauci A., Hauser S., Longo D.: Harrison's Principles of Internal Medicine, textbook, McGraw-Hill Professional, New York, 2015. <i>Literature in Serbian:</i> 3. Kopitović I.: Interna medicina za studente zdravstvene nege, udžbenik, Medicinski fakultet, Novi Sad, 2015. 4. Manojlović D. i dr.: Interna medicina I, II udžbenik, Zavod za udžbenike i nastavna sredstva, Beograd, 2003. 5. Antić S., Ilić S., Interna medicina, udžbenik, Medicinski fakultet, Niš, 2009. 6. Đurica S.: Interna medicina, udžbenik, Viša medicinska škola, Beograd, 2000. 7. Manojlović S.: Hitna stanja u internoj medicini, udžbenik, Zavod za udžbenike, Beograd, 2011.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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 NUCLEAR MEDICINE

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Basics of Nuclear Medicine				
Language of instruction: Serbian				
Course status: mandatory				
Semester: second year, fourth semester				
ECTS: 5				
Requirement: no				
Course objective: Acquisition of knowledge about the characteristics of isotopes used in nuclear medicine, the production of radioisotopes, generators, radiopharmaceuticals, instrumentation, quality control, and safety measures in the use of open sources of radiation.				
Course outcome: Upon completing the course and passing the exam, the student will be able to understand the principles of nuclear medicine; describe the preparation of nuclear medicine equipment for performing diagnostic procedures and measuring radioactivity; list acquisition parameters for various types of nuclear medicine diagnostic procedures; calculate the volume of a radiopharmaceutical that needs to be administered to a patient for a given radiopharmaceutical activity; describe the monitoring of equipment operation and patient condition during imaging; review the recorded examination; list radiation protection measures when working with open sources of radiation; determine radioactivity and operate a scintillation counter; analyze the quality and completeness of control planar images and specific parameters of SPECT, SPECT/CT, and PET/CT imaging; independently perform measurements with a dose calibrator for activity measurement; and critically interpret the results.				
Course content: <i>Lectures</i> Atom and radionuclides. Radioactivity, radioactive decay, and types of radiation. Interaction of ionizing radiation with matter. Biological effects of ionizing radiation. Measurement of radioactivity and SI units. Radionuclides and methods of obtaining radionuclides. Radiopharmaceuticals – applications in diagnosis and therapy. Detection of ionizing radiation and radiation detectors. Gamma camera and types of scintigraphy. Hybrid devices. Positron emission tomography. Sources of ionizing radiation and radiation exposure. Effects of ionizing radiation on the body. Biological effects of ionizing radiation. Protection from open sources of ionizing radiation. <i>Exercises</i> Quality control of radiopharmaceuticals. Specifics of working with and handling radioisotopes – basic principles and protection. Preparation of radioisotopes and radiopharmaceuticals – basic principles. Administration of radiopharmaceuticals. Determining the volume of a radiopharmaceutical to be administered to a patient for a given radiopharmaceutical activity. Independent measurements using a dose calibrator for activity measurement. Working with a gamma camera – acquisition, collimator replacement. Setting parameters for static, dynamic, SPECT, and SPECT/CT studies. Quality control of gamma cameras and hybrid systems. Working with a PET/CT scanner. Quality control and calibration of PET/CT scanners. Preparation and processing of the patient upon arrival for PET/CT imaging.				
Literature: <i>Literature in English:</i> 1. Ziessman H. A., O'Malley J. P., Thrall J. H.: Nuclear Medicine: The Requisites (Requisites in Radiology), Saunders, New York, 2013. <i>Literature in Serbian:</i> 2. Šobić Šaranović D., Artiko V.: Nuklearna medicina, udžbenik, Medicinski fakultet, Beograd, 2020. 3. Bogićević M., Ilić S.: Nuklearna medicina metodologija i klinika, udžbenik, Klinički centar Niš, 2007. 4. Vlajković M., Rajić M.: Repetitorijum kliničke nuklearne medicine, Galaksijanis, Niš, 2020. 5. Vlajković M.: Praktikum nuklearne medicine, Galaksijanis, Niš, 2020. 6. Han R., Obradović B., Pavlović S.: Nuklearna medicina, udžbenik, Medicinski fakultet, Beograd, 2008. 7. Borota R., Stefanović Lj.: Nuklearna medicina, udžbenik, Medicinski fakultet, Novi Sad, 1992. 8. Dodig D., Kusić Z.: Klinička nuklearna medicina, Medicinska naklada, Zagreb, 2012.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	45	240	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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		

BASICS OF NURSING

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Basics of Nursing				
Language of instruction: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Springhouse: Nursing procedures, prevod, Data Status, Beograd, 2010. 2. Gulanick M., Myers J. L.: Nursing Care Plans-Nursing Diagnoses and Intervention, Elsevier, Mosby, New York, 2007. 3. Potter P. A., Perry A. G., Stockert P. A., Hall A.: Fundamentals of Nursing, textbook, Elsevier, New York, 2020. 4. Lynn P. B.: Taylor's Clinical Nursing Skills, A Nursing Process Approach, textbook, LWW, Liverpool, 2018. <i>Literature in Serbian:</i> 5. Rajak S., Imbronjević V.: Osnovi zdravstvene nege, udžbenik, Omega MS Pharmacy, Novi Sad, 2018. 6. Kekuš D.: Zdravstvena nega u primarnoj zdravstvenoj zaštiti, Visoka zdravstvena škola, Beograd, 2015. 7. Rudić R., Kocev N., Munćan B.: Proces zdravstvene nege, Praktikum, Knjiga-komerc, Beograd, 2005. 8. Tijić M., Đuranović D., Rudić R., Milović Lj.: Zdravstvena nega i savremeno sestrinstvo, udžbenik, Naučna KMD, Beograd, 2010. 9. Munćan B.: Zdravstvena nega, udžbenik, Beograd, 2014. 10. Babić L.: Zdravstvena nega u radiologiji, udžbenik, Licej, Beograd, 2011. 11. Stojković B.: Zdravstvena nega u radiologiji, udžbenik, Naučna knjiga, Beograd, 2006. 12. Maksimović J.: Uvod u medicinu sa teorijom medicine, udžbenik, Medicinski fakultet, Novi Sad, 2001.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	15	300	0	0
Methods of teaching: lectures using various 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		
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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: 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 treatment, 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Watson W., Lucas C., Hoy A., Wells J.: Oxford handbook of Palliative Care, Oxford University Press, Oxford, 2005. 2. DeVita T. V.: Cancer Principles and Practice of Oncology, textbook, Lippincott, New Jersey, 2010. 3. Itano J. K., Brant J., Conde F., Saria M. (ed.): Core Curriculum for Oncology Nursing, textbook, Saunders, New York, 2015. <i>Literature in Serbian:</i> 4. Kostić-Milosavljević M.: Onkologija, Visoka zdravstvena škola strukovnih studija, Beograd, 2015. 5. Bošković S.: Zdravstvena nega u onkologiji, Visoka zdravstvena škola strukovnih studija, Beograd, 2012. 6. Jovanović D. (ur.): Osnovi onkologije i palijativna nega, udžbenik, Medicinski fakultet, Novi Sad, 2008. 7. Vrdoljak E. i sar.: Klinička onkologija, Medicinska naklada, Zagreb, 2013.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	240	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, 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 practic	20		
Colloquiums/exam	30		

BASICS OF RADIOTHERAPY

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Basics of Radiotherapy				
Language of instruction: Serbian				
Course status: mandatory				
Semester: second year, fourth semester				
ECTS: 8				
Requirement: Radiology Physics and Basics of Radiology Work Methods				
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: <i>Lectures:</i> Basic principles of radiotherapy. Basics of radiation physics. Ionization, types of ionizing radiation, absorption of (electromagnetic) radiation, and interaction of ionizing radiation with matter. Mechanism and types of effects of ionizing radiation on biological systems. Basics of dosimetry, radiation measurement. Basics of radiobiology. Dose and fractionation of radiation, the "4 Rs" in radiotherapy. Radiation regimens, radiosensitivity, tumor radiocurability, and tissue tolerance. Indications for the use of radiotherapy – factors influencing the application of radiotherapy. Classification of radiotherapy according to treatment goals and combination with other treatment modalities. Dose distribution. Classification of radiotherapy according to sources and radiation energy. Radiotherapy devices (standard and "Gamma" knife). External beam radiation techniques. Brachytherapy techniques. Quality assurance (QA) procedures in radiotherapy. Basic principles of oncological treatment. Combining radiotherapy with other types of oncological treatment. Complications of radiotherapy treatment. TNM classification. Imaging methods in radiotherapy. <i>Exercises:</i> Exercises are compatible with theoretical classes and imply practice and demonstrations 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, presentation, and documentation of the procedure. Linear accelerator – operating principle, therapy documentation, radiation chart for external beam radiotherapy. Brachytherapy device – main components, operating principle, radiation chart for brachytherapy. Brachytherapy planning, presentation, and documentation of the procedure. Verification of external beam radiation accuracy ("portal verification"). Demonstration of dosimetric procedures and quality assurance controls in radiotherapy. Radiotherapy information system – demonstration of its operation. Imaging methods in radiotherapy.				
Literature: <i>Literature in English:</i> 1. Kenneth L. B., Lampignano J.: Bontrager's Handbook of Radiographic Positioning and Techniques, Mosby Elsevier, St. Louis, 2013. 2. NCCN Clinical Practice Guidelines in Oncology. Breast Cancer. Version 1. 2021. Available from: https://www.nccn.org/professionals/physician_gls/default.aspx#site 3. Vincent Grégoire, Matthias Guckenberger, Karin Haustermans et al. Image guidance in radiation therapy for better cure of cancer First published: 13 June 2020, https://doi.org/10.1002/1878-0261.12751. <i>Literature in Serbian:</i> 4. Mašulović D., Stević R., Milošević Z., Sagić D. i sar. Radiologija. Medicinski fakultet Univerziteta u Beogradu, CIBID, Beograd, 2021. 5. Plešinac Karapandžić V. i sar. Nacionalni radioterapijski protokoli za lečenje malignoma: Ministarstvo zdravlja Republike Srbije "Drugi projekat razvoja zdravstva Srbije", 2022 Beograd. 6. Mileusnić D., Durbaba M.: Radijaciona onkologija, udžbenik, Altanova, Beograd, 2012. 7. Ivanov O.: Savremena radiaciona onkologija. Medicinski fakultet Univerziteta u Novom Sadu, Novi Sad, 2020. 8. Stanković J.: Osnovi radiološke fizike u radioterapiji, udžbenik, Fakultet za fizičku hemiju, Beograd, 2007.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with

				student, projects...)
30	30	240	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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/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: Serbian				
Course status: mandatory				
Semester: third year, fifth semester				
ECTS: 10				
Requirement: Basics of Nursing				
Course outcome: Students are trained to practically apply the acquired knowledge from all surgical disciplines necessary for the acquisition of skills in the care of surgical patients, which includes previous mastering of practical knowledge and acquiring skills necessary for the care of surgical patients.				
Course content: <i>Lectures</i> Surgical diagnostics and seminology; war surgery doctrine; the organization of care for the injured in peacetime and wartime conditions; asepsis in surgery in war conditions; wounds, specifics of war wounds, surgical infections; surgical terminology and types of surgical interventions; post-operative complications, foreign bodies in surgery; surgical principles in oncology; neck surgery and surgical breast diseases; abdominal surgery; specificities of pediatric surgery, urgent conditions in neonatal surgery; surgery of the chest wall, pleura, and lungs, mediastinum, chest trauma; cardiothoracic and vascular surgery; surgical treatment of burns, basic principles of plastic surgery, soft tissue and skin tumors, general principles and methods in reconstructing skin defects, diseases and injuries of the hand; neurosurgery; urology; orthopedic surgery. <i>Exercises</i> Principles, methods, and means of sterilization and disinfection in surgery, asepsis in surgery and in wartime conditions. Physical examination of surgical patients, diagnostic procedures in surgery. Types of immobilization. Initial hospital care for the injured. Surgical wound management. Care of surgical infections. Initial treatment of burn patients. Minor surgical interventions. Operating room during operation. Postoperative care. Specifics of chest surgery, cardiothoracic surgery, oncological surgery, pediatric surgery, plastic and reconstructive surgery, vascular surgery, neurosurgery, urology, abdominal surgery, orthopedic surgery, traumatology of the locomotor system.				
Course outcome: Students are trained to practically apply the acquired knowledge from all surgical disciplines necessary for the acquisition of skills in the care of surgical patients, which includes previous mastering of practical knowledge and acquiring skills necessary for the care of surgical patients.				
Literature: <i>Literature in English:</i> 1. Pudner R.: Nursing the Surgical Patient, Elsevier, 2005. 2. 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. 3. Lewis L.S., Dirksen S.R., Heitkemper M.M., Bucher L.: Medical Surgical Nursing: Assessment and Management of Clinical Problems, Toronto, 2011. <i>Literature in Serbian:</i> 4. Maksimović Ž.: Hirurgija, udžbenik za studente, CIBID, Beograd, 2008. 5. Stevović M. i sar.: Hirurgija za studente i lekare, udžbenik, Savremena administracija, 2000. 6. Stojković J.: Zdravstvena nega u hirurgiji, Altera Books, Beograd, 2014. 7. Dragović M.: Ambulantna hirurgija, Velarta, Beograd, 2006. 8. Glišić R.: Zdravstvena nega u hirurgiji, Cicero, Beograd, 2011. 9. Petković S., Bukurov S.: Hirurgija: udžbenik za medicinare i lekare, Medicinska knjiga, Zagreb, 1982. 10. Domazet N.: udžbenik, Hirurgija sa ortopedijom i traumatologijom, Beograd, 1996. 11. Terzić N.: Zdravstvena nega u hirurgiji, udžbenik, Lazarevac, 2006.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	15	0	0	0
Methods of teaching: lectures using various video materials, exercises, case studies, discussion, dummy 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		

BASICS OF ULTRASOUND DIAGNOSTICS

Study program: Radiology				
Type and level of study: undergraduate professional 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, cooperation 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: <i>Literature in English:</i> 1. Escoffre J., Bouakaz A. (eds.): Therapeutic Ultrasound, Springer International Publishing, Kopenhagen, 2016. <i>Literature in Serbian:</i> 2. Lukač I., Kovačević N., Mijatović-Stefanović D. i sar.: Osnovi dijagnostičkog ultrazvuka u gastroenterologiji i nefrologiji, udžbenik, Zavod za udžbenike i nastavna sredstva, Beograd, 2004. 3. Palmer P. E. S.: Ultrazvučna dijagnostika, Narodna i univerzitetska biblioteka Republike Srpske, Banja Luka, 2006.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	45	300	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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/exam	20			

BUSINESS COMMUNICATION SKILLS

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Business Communication Skills				
Language of instruction: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Hugman B.: Healthcare Communication, textbook, Pharmaceutical Press, London, 2009. 2. Lloyd M., Bor R., Noble L.: Clinical Communication Skills for Medicine, textbook, Elsevier, New York, 2018. <i>Literature in Serbian:</i> 3. Kekuš D.: Komunikacije u profesionalnoj praksi zdravstvenih radnika, II izd., udžbenik, Beograd, 2010. 4. Kekuš D.: Modeli integrisanih komunikacija u zdravstvu, udžbenik, Fakultet organizacionih nauka, Beogradu, 2009. 5. Holc K.: Veština uspešne komunikacije, Laguna, Beograd, 2017. 6. Lejman K., Djufrej D.: Poslovna komunikacija, Data Status, Beograd, 2015. 7. Tomić Z.: Komunikacija i javnost, Čigoja štampa, Beograd, 2007.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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			

BUSINESS ENGLISH

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Business English				
Language of instruction: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. MacLean J.: English in Basic Medical Science, textbook, Oxford University Press, Oxford, 2000. 2. 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 Press, Oxford, 2008. 5. Evans V., Dooley J., Tran T. M.: Career Paths, Medical Book 1, udžbenik, Express Publishing, Berkshire, 2018. <i>Literature in Serbian:</i> 6. Dragović R.: Engleski za zdravstvene radnike, udžbenik, Naučna knjiga, Beograd, 2004.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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			

BUSINESS GERMAN

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Business German				
Language of instruction: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Menschen A1 KB und Menschen A1 AB, udžbenik, Klett Verlag, Stuttgart, 2018. 2. Pude E. A., Specht F.: Menschen, Deutsch als Fremdsprache Kursbuch mit DVD-ROM, udžbenik, Hueber Verlag, Munchen, 2012. 3. Loibl B. et al.: Schritte Plus im Beruf, Kommunikation am Arbeitsplatz, Max Hueber Verlag, Ismaning, 2015. 4. Becker N., Braunert J.: Alltag, Beruf, Kursbuch+Arbeitsbuch, Max Hueber Verlag, Ismaning, 2009. 5. Becker N., Braunert J., Schlenker W.: Unternehmen Deutsch Grundkurs. Kursbuch, Klett Verlag, Stuttgart, 2005. 6. Becker N., Braunert J.: Unternehmen Deutsch Grundkurs, Arbeitsbuch, KlettVerlag, Stuttgart, 2004. <i>Literature in Serbian:</i> 7. Grammatik - Ganz klar Übungsgrammatik A1-B1, uz audio materijal, Hueber Verlag, kratak pregled gramatike sa vežbanjima „Hallo aber Deutsch“. 8. Nikolovski V.: Gramatička vežbanja „Eine kleine Übungsgrammatik“, Zavod za udžbenike i nastavna sredstva, Schritte international 1, Grammatikspiele. 9. Vučković-Stojanović M.: Uvod u nemački poslovni jezik, udžbenik, Savremena administracija, Beograd, 2005.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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			

CLINICAL NUCLEAR MEDICINE

Study program:	Radiology			
Type and level of study:	undergraduate professional studies			
Course:	Clinical Nuclear Medicine			
Language of instruction:	Serbian			
Course status:	elective			
Semester:	third year, sixth semester			
ECTS:	5			
Requirement:	Basics of Nuclear Medicine			
Course objective: The aim of the course is the acquisition of theoretical and practical knowledge related to the preparation and application of radiopharmaceuticals for diagnostic nuclear medicine procedures; acquisition of theoretical and practical knowledge in the field of diagnostics of thyroid nodules; acquisition of theoretical and practical knowledge related to the preparation and application of radiopharmaceuticals for therapeutic nuclear medicine procedures; acquisition of theoretical and practical knowledge regarding the admission, accommodation, monitoring, and discharge of patients in the therapy unit after radionuclide therapy; acquisition of theoretical and practical knowledge in the field of dosimetry and radiation monitoring in the therapy unit after radionuclide therapy, as well as knowledge in the case of accidents or contamination. Acquisition of knowledge about the application of nuclear medicine methods in various medical indications. Acquisition of knowledge about the functioning of nuclear medicine devices (detectors, calibrators, probes, gamma cameras, SPECT, SPECT/CT, PET/CT).				
Course outcome: After completing the course and passing the exam, students will be able to prepare and administer radiopharmaceuticals for diagnostic and therapeutic nuclear medicine procedures, analyze quality control of equipment, image quality, and specific parameters of SPECT, SPECT/CT, and PET/CT imaging, as well as intraoperative detection; interpret results and identify shortcomings and problems; work independently during the admission, accommodation, monitoring, and discharge of patients in the therapy unit after radionuclide therapy; and know how to respond appropriately in the event of an accident or contamination in order to carry out decontamination.				
Course content: <i>Lectures</i> Radionuclide methods in neurology, endocrinology, cardiology, pulmonology, the vascular and lymphatic system, the musculoskeletal system, nephrourology, gastroenterology, hepatology, hematology, oncology, in the detection of infections and inflammations, and metabolic diseases, as well as the specific features of nuclear medicine applications in pediatrics. Radiobiological principles of radionuclide therapy. Indications and contraindications for radionuclide therapy. Dosimetry of hospitalized patients after the administration of radionuclide therapy. Therapy of benign thyroid diseases, differentiated thyroid carcinoma, neuroendocrine tumors with somatostatin analogues. PRRT therapy. Therapy of neuroendocrine tumors using MIBG. Therapy of painful bone metastases. Radiosynoviorthesis. Radioimmunotherapy of lymphoma. Radionuclide therapy of malignant liver tumors. Radionuclide therapy of prostate cancer and other cancers. <i>Exercises</i> Preparation and administration of radiopharmaceuticals for diagnostic nuclear medicine procedures. Preparation and administration of radiopharmaceuticals for therapeutic nuclear medicine procedures. Quality control of radiopharmaceuticals. Dosimetry of hospitalized patients after radionuclide therapy. Implementation of decontamination measures in case of accident or contamination. Thyroid: working with outpatients and inpatients. Thyroid scintigraphy with different radiopharmaceuticals. Whole-body scintigraphy. Scintigraphy, SPECT, SPECT/CT, PET/CT of the brain, liver, gastrointestinal tract, heart, vascular system, skeleton, kidneys (static and dynamic, clearance), myocardium, lungs, lymphoscintigraphy (sentinel). Scintigraphy and tomography of tumors, infections, and metabolic and degenerative diseases (planar, SPECT, SPECT/CT). PET/CT oncological protocol. Preparation and processing of pediatric patients. Radionuclide therapy unit with procedures.				
Literature: <i>Literature in English:</i> 1. Mihailovic J., Goldsmith S. J., Killeen R.: FDG PET/CT in Clinical Oncology, Case Based Approach with Teaching Points, Springer Verlag, Berlin, 2012. <i>Literature in Serbian:</i> 2. Šobić Šaranović D., Artiko V.: Nuklearna medicina, udžbenik, Medicinski fakultet, Beograd, 2020. 3. Dodig D., Kusić Z.: Klinička nuklearna medicina, Medicinska naklada, Zagreb, 2012. 4. Bogičević M., Ilić S.: Nuklearna medicina metodologija i klinika, udžbenik, Klinički centar Niš, 2007. 5. Vljaković M.: Praktikum nuklearne medicine, Medicinski fakultet, Galaksijanis, Niš, 2020. 6. Borota R., Stefanović Lj.: Nuklearna medicina, udžbenik, Medicinski fakultet, Novi Sad, 1992. 7. Vljaković M., Rajić M.: Repetitorijum kliničke nuklearne medicine, Galaksijanis, Niš, 2020.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)

30	30	0	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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/exam	20			

DIAGNOSTIC RADIOLOGY

Study program: Radiology				
Type and level of study: undergraduate professional 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, urethrocystography, hysterosalpingography, deferentovesiculography and other diagnostic radiology.				
Course content: <i>Lectures:</i> 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 holecography, surgical and cholangiography through T drain; Contrast examinations of the urogenital tract: excretory urography with modifications, retrograde and anterograde urography, urethrocistography; 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. <i>Exercises:</i> Exercises are compatible with theoretical classes and imply practice and demonstrations in the teaching base.				
Literature: <i>Literature in English:</i> 1. Bontrager K. L., Lampignano J. P.: Textbook of Radigraphic Positioning and Related Anatomy, Mosby Elsevier, St. Louis, 2005. <i>Literature in Serbian:</i> 2. Lazić J. i sar.: Radiologija, Medicinske komunikacije, udžbenik, Medicinska knjiga, Beograd, 2007. 3. Bošnjaković P. i sar.: Praktikum kliničke radiologije, udžbenik, Data status, Beograd, 2009. 4. Wicke L.: Atlas radiološke anatomije, Data status, Beograd, 2007.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
60	75	300	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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/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:	Serbian
Course status:	mandatory
Semester:	third year, fifth semester
ECTS:	8
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:	<i>Lectures</i> 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; hypovolemic 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. <i>Exercises</i> 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) – exercises 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:	<i>Literature in English:</i> - Advanced First Aid, CPR, and AED, American Academy of Orthopaedic Surgeons (AAOS), Jones & Bartlett Learning, 2017. - 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. - Hammond B. B., Zimmermann P. G. (ed.): Sheehy's Manual of Emergency Care: Sheehy's Manual of Emergency Care,

textbook, Mosby, London, 2012.

4. Carsten Lott i sar.: Advanced life support course manual, European resuscitation council, ERC guidelines 2015.

Literature in Serbian:

5. Pavlović A.: Prva pomoć, udžbenik, Obeležja, Beograd, 2007.
6. Kalezić N. i sar.: Inicijalni tretman urgentnih stanja u medicini, udžbenik, Medicinski fakultet, Beograd, 2016.
7. Vučović D.: Urgentna medicina, udžbenik, Obeležja, Beograd, 2002.
8. Pavlović A.: Kardiopulmonalno cerebralna reanimacija, Obeležja, Beograd, 2004.
9. Newton C. R. H., Khare R. K.: Urgentna medicina, Besjeda, Banja Luka, 2007.

Number of classes:

Lectures	Exercises	Other classes (professional practice...)	Study research work	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: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Fregmen B. F.: Medical Law and Ethics, textbook, Prentice Hall, New Jersey, 2011. <i>Literature in Serbian:</i> 2. Marić J.: Medicinska etika, autorsko izdanje, Beograd, 2008. 3. Lazarević A.: Socijalna medicina, autorsko izdanje, 2005. 4. Zakoni i podzakonska akta Republike Srbije iz oblasti zdravstva. 5. Nenadović M.: Medicinska etika, Medicinski fakultet, Priština, 2007. 6. Grujić V., Martinov Cvejin M., Legetić B.: Socijalna medicina, II izd., udžbenik, Medicinski fakultet, Novi Sad, 2001.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Cydulka R., Cline D., Ma O. J., Fitch M., Joing S., Wang V.: Tintinalli's Emergency Medicine Manual, McGraw-Hill Education, New York, 2017. 2. Hammond B. B., Zimmermann P. G.: Sheehy's Manual of Emergency Care: Sheehy's Manual of Emergency Care, Mosby, London, 2012. 3. Carsten Lott i sar.: Advanced life support course manual, European resuscitation council, textbook, ERC guidelines 2015. 4. Advanced First Aid, CPR, and AED, American Academy of Orthopaedic Surgeons (AAOS), Jones & Bartlett Learning, 2017. <i>Literature in Serbian:</i> 5. Pavlović A.: Prva pomoć, udžbenik, Obeležja, Beograd, 2007. 6. Kalezić N. i sar.: Inicijalni tretman urgentnih stanja u medicini, udžbenik, Medicinski fakultet, Beograd, 2016. 7. Vučović D.: Urgentna medicina, udžbenik, Obeležja, Beograd, 2002. 8. Newton C. R. H., Khare R. K.: Urgentna medicina, Besjeda, Banja Luka, 2007. 9. Pavlović A.: Kardiopulmonalna reanimacija, Obeležja, Beograd, 2007.				
Number of classes				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0
Methods of teaching:				

lectures, exercises, case studies; e-learning, exercises 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: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Boltz. M.: Evidence-Based Geriatric Nursing Protocols for Best Practice, 4th ed., Springer Publishing Company, New York, 2012. 2. 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. 3. Warshaw G., Potter J., Flaherty E., McNabney M. K., Heflin M. T., Ham R.: Ham's Primary Care Geriatrics, textbook, Elsevier, New York, 2021. 4. Taylor R.: Oxford Handbook of Palliative Care, Oxford Press, Oxford, 2009. <i>Literature in Serbian:</i> 5. Vukadinov J.: Gerijatrija i nega starih osoba, udžbenik, Medicinski fakultet, Novi Sad, 2006. 6. Šarenac D.: Zdravstvena nega starih, udžbenik, Licej, Beograd, 2009. 7. 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. 8. Dujaković Z. i sar.: Gerijatrija - medicina starije dobi, udžbenik, Medicinska naklada, Zagreb, 2008.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0
Methods of teaching: lectures using 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: Serbian				
Course status: elective				
Semester: third year, sixth semester				
ECTS: 5				
Requirement: no				
Course objective: Mastering basic legal concepts in the field of health legislation. Familiarizing students with the legal aspect of health care while developing professional awareness, responsibility, and humanity.				
Courses outcome: Upon the completion of the course and passing of the exam the student will be able to define the basic concepts of health care legislation; list the main aspects of the Law on Health Insurance and Health Care Protection, as well as the basic legal aspects of nursing; explain the organization of the Chamber of Health Care Professionals; and to outline the procedures for acquiring, renewing and revoking licenses for health care professionals. Additionally, the student will be able to identify indicators of health care quality and understand and explain the rights and responsibilities of health care professionals.				
Course content: <i>Lectures</i> The Law on Health Care Protection - basic provisions related to health care rights, participants in health care, health care activities, health care system, and financing of health care; principles of health protection; The Law on Health Insurance; The Law on Social Protection; Regulation on detailed conditions for performing health activities; Regulation on the internal organization of health care institutions; patient rights; legal regulations for the protection of the population from infectious diseases; legal aspects of the nursing profession; elements of the draft law on nursing; Law on Chambers, acquisition, renewal, and revocation of licenses for health care professionals; legal aspects of continuous medical education; Regulation on health care quality indicators; legal aspects of professional supervision and (re)accreditation processes of health care institutions; legal aspects of occupational health and safety; the specifics of health and social legislation relating to the area of health care from the perspectives of the patient, nurse, health institution, state, and society. <i>Exercises</i> During exercise sessions, a comparative analysis of legal aspects primarily in health care is conducted, comparing them to solutions from other countries in the region and the EU, as well.				
Literature: <i>Literature in English:</i> 1. 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. 2. De Gooijer R.: Trends in EU Health Care Systems, Winfried, 2007. 3. Morrissey M. A.: Health Insurance, textbook, Health Administration Press, London, 2007. 4. Beik Janet I.: Health Insurance Today: A Practical Approach, textbook, Saunders, Philadelphia, 2010. 5. Fregmen B. F.: Medical Law and Ethics, Prentice Hall, New Jersey, 2011. <i>Literature in Serbian:</i> 6. ICN regulativa i regulativa EU koje se odnose na sve aspekte leka, zdravstvenog osiguranja i prava i obaveza u pružanju zdravstvene zaštite, 2012. 7. Šolak Z.: Ekomnomika zdravstvene zaštite, Zavod za udžbenike i nastavna sredstva, Beograd 2003. 8. Lazarević A.: Socijalna medicina, autorsko izdanje, Beograd, 2015. 9. Simić S. i sar.: Socijalna medicina, udžbenik, Medicinski fakultet, Beograd, 2012. 10. Šolak Z.: Ekomnomika zdravstvene zaštite, Zavod za udžbenike i nastavna sredstva, Beograd 2003. 11. Aktuelni zakoni i podzakonska akta Republike Srbije iz oblasti zdravstva.				
Number of classes:				
Theoretical lectures	Theoretical exercises	Professional practice	Study research work	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: 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: <i>Lectures</i> Introduction to management and human resource management; differences between management and leadership; basic concepts and functions of management; management in healthcare; management in nursing; 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Beik J. I.: Health Insurance Today: A Practical Approach, Saunders, Philadelphia, 2010. 2. Flynn W. J., Mathis R. L., Jackson J. H.: Healthcare Human Resource Management, textbook, Cengage Learning, Boston, 2006. <i>Literature in Serbian:</i> 3. Legetić B.: Principi menadžmenta, udžbenik, Ekonomski fakultet, Subotica, 2007. 4. Marinković Lj: Menadžment u zdravstvenim organizacijama, G.A.D. Beograd, 2001. 5. Mićović P.: Zdravstveni menadžment, Obeležja, Beograd, 2008. 6. Vujić D.: Menadžment ljudskih resursa i kvalitet, Centar za primenjenu psihologiju društva psihologa Srbije, Beograd, 2003. 7. Probbins S., Judge T.: Organizaciono ponašanje, Mate, Zagreb, 2009. 8. Frančesko M.: Kako unaprediti menadžment u preduzeću, Novi Sad, Prometej, 2003.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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:	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. Additionally, upon completion of the course and passing of the exam, the student will be familiar with cellular organization and basic characteristics of bacteria, viruses, and parasites.
Course content:	<i>Lectures</i> 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; disease prevention; widely applicable international and national legislation on food safety; 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; pathogenicity and virulence factors, antibiotics, antimycotics and chemotherapeutics, physiological importance of microflora, rapid diagnostic tests and molecular methods in microbiology; general and special virology: 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. <i>Exercises</i> 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:	<i>Literature in English:</i> 1. Weston D.: Infection Prevention and Control: Theory and Practice for Healthcare Professionals, John Wiley & Sons, New York, 2008. 2. Andersen B. M.: Prevention and Control of Infections in Hospitals, textbook, Practice and Theory, Springer, Berlin, 2016. 3. Tortora Gerard J., Funke Berdell R., Case Christine L.: Microbiology: An Introduction, textbook, Books a la Carte Edition, Benjamin Cummings, New York, 2009. <i>Literature in Serbian:</i> 4. Novaković B., Grujić V.: Higijena i zdravstveno vaspitanje, udžbenik, Medicinski fakultet, Novi Sad, 2005. 5. Kekuš D.: Zdravstveno vaspitanje, udžbenik, Digital art, Beograd, 2009. 6. Kristoforović-Ilić M.: Higijena sa medicinskom ekologijom, udžbenik, Ortomedics, 2003. 7. 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.
Number of classes:	

Lectures	Exercises	Other classes (professional practice...)	Study research work	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:	12			
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:	<i>Lectures:</i> 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, oesophageal 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. <i>Exercises:</i> 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:	<i>Literature in English:</i> 1. Brian Funaki, Jonathan Lorenz, Thuong Van Ha: Teaching Atlas of Vascular and Non-vascular Interventional Radiology, Kindle Edition, New York, 2021. 2. Marcelo Guimaraes: Uflacker's Atlas of Vascular Anatomy, Kindle Edition, New York, 2020. <i>Literature in Serbian:</i> 3. Goldner B. , Sagić D.: Klinička radiologija kardiovaskularnog sistema, Medicinski fakultet, Beograd, 2009. 4. Hebrang A., Klarić Čustović R.: Radiologija, Medicinska Naklada, Zagreb, 2007. 5. Marković Ž.: Vaskularna interventna radiologija, Medicinski fakultet, Beograd, 1998.			
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
60	60	270	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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/exam		20		

LABORATORY NUCLEAR MEDICINE

Study program:	Radiology			
Type and level of study:	undergraduate professional studies			
Course:	Laboratory Nuclear Medicine			
Language of instruction:	Serbian			
Course status:	elective			
Semester:	third year, sixth semester			
ECTS:	5			
Requirement:	Basics of Nuclear Medicine			
Course objective: The aim of the course is to acquire knowledge about the procedures of reception, synthesis, preparation, and quality control of radiopharmaceuticals; the in vitro application of isotopes in diagnostics; the basic principles of radioimmunological, immunoradiometric, and related assays; the application of these assays in endocrinology, oncology, and other related fields; as well as to familiarize students with the use of laboratory nuclear medicine methods in endocrinology, hematology, nephrourology, and other clinical indications.				
Course outcome: After completing the course and passing the exam, the student will have acquired knowledge and be qualified to participate in the application of nuclear medicine in the preparation, synthesis, and quality control of diagnostic and therapeutic radiopharmaceuticals, in laboratory methods (RIA, IRMA), as well as in hematology, nephrourology, and other clinical indications.				
Course content: <i>Lectures</i> Familiarization with the procedures of reception, synthesis, preparation, and quality control of radiopharmaceuticals, as well as with the principles and application of radioimmunological and immunoradiometric assays in determining the concentration of various biologically active substances (hormones, tumor markers). Application of nuclear medicine methods in hematology, nephrourology, and other clinical indications. <i>Exercises</i> Familiarizing the student with the principles of preparation, synthesis, and quality control of radiopharmaceuticals, as well as with the performance of radioimmunological, immunoradiometric, hematological, nephrourological, and other clinical methods of laboratory nuclear medicine in real conditions.				
Literature: <i>Literature in English:</i> 1. Mastenbjörk M., Meloni S.: Lab Values: Everything You Need to Know about Laboratory Medicine and it’s Importance in the Diagnosis of Diseases, Medical Creations, London, 2020. 2. Bennett P. A.: Diagnostic Imaging: Nuclear Medicine, Elseiver, New York, 2020. <i>Literature in Serbian:</i> 3. Bogićević M., Ilić S.: Nuklearna medicina, metodologija i klinika, udžbenik, Medicinski fakultet, Niš, 2007. 4. Vlajković M.: Praktikum nuklearne medicine, Galaksijanis, Niš, 2020. 5. Šobić Šaranović D., Artiko V.: Nuklearna medicina, udžbenik, Medicinski fakultet, Beograd, 2020. 6. Dodig D., Kusić Z.: Klinička nuklearna medicina, Medicinska naklada, Zagreb, 2012.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	180	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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/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: 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 of health care institutions, governmental bodies, or for the purpose of certain public campaigns and initiatives.				
Course outcome: Upon the completion of the course, students will be able to understand strategic marketing in health care and be capable to independently conduct research of marketing methods convenient for solution of a specific project task in terms of health care institutions, governmental bodies, or in terms of public campaigns or initiatives. 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: <i>Lectures</i> Nature and character of marketing; evolution of marketing and approaches in studying it. Marketing management process; changes of marketing in health care institutions, government or governmental bodies. Presentation and analysis of marketing in health care. 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 (examples of campaigns in Serbia or in the region: campaigns against smoking, diabetes, self-check promotions for breast cancer....). 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. Different types of marketing materials in health care, depending on the target audience. Marketing outsourcing, marketing agencies; printed material, printed media, billboards, electronic media, social networks. Direct marketing; fairs, conferences, meetings; public events, health festivals. Sponsorships. Website; promotional material; presentation; marketing and PR. Public appearances of employees, health care institution management, governmental bodies. Marketing in crisis or emergency situations. Public appearances of employees. Dress code. Appearance of employees, institution. <i>Exercises</i> Analysis and discussion on practical examples of marketing campaigns – workshops. Market segmentation and research; SWOT analysis, benchmarking and portfolio. Designing promotional campaign plans in health care – workshop on a given topic in health care. Analysis of examples of marketing campaigns in Serbia examples of workshops (e-learning, analysis of existing initiatives and public events) 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, with a focus on the target group type. Direct marketing - simulation. Fairs, conferences, meetings, public events - 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: <i>Literature in English:</i> 1. Berkowitz N. E.: Essentials of Health Care Marketing, textbook, Jones & Bartlett Learning, Boston, 2010. <i>Literature in Serbian:</i> 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. 4. Ljubojević Č. Ćirić M.: Marketing usluga, Novi Sad, 2017.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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 representatives 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: 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: <i>Lectures</i> 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.				
<i>Exercises</i> 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: <i>Literature in Serbian:</i> 1. Simić M., Kovačević K.: Mentalna higijena, udžbenik, autorsko izdanje, Beograd, 2004. 2. Kalićanin 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. <i>Literature in English:</i> 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, Rotterdam, 2010.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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 professional studies				
Course: Modern Diagnostic Radiology Methods				
Language of instruction: Serbian				
Course status: mandatory				
Semester: third year, sixth semester				
ECTS: 10				
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: <i>Lectures:</i> 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. <i>Exercises:</i> 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: <i>Literature in English:</i> 1. Hagg J.: CT and MRI of the Whole Body, Vol. 2 (Computed Tomography and Magnetic Resonance Imaging of the Whole Body), Mosby Elsevier, Philadelphia, 2009. <i>Literature in Serbian:</i> 2. Lukač, Kovačević N.: Osnovi dijagnostičkog ultrazvuka u gastroenterologiji i nefrologiji, udžbenik, Data status, Beograd, 2004. 3. Hebrang A., Klarić Čustović R.: Radiologija, udžbenik, Mladinska naklada, Zagreb, 2007. 4. Lalošević Đ. i sar.: Radiologija, udžbenik, autorsko izdanje, Beograd, 2012.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
60	60	300	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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/exam	20			

NUTRITIONISM

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Nutritionism				
Language of instruction: Serbian				
Course status: elective				
Semester: second year, third semester				
ECTS: 5				
Requirement: no				
Course objective: The objective of the course is the acquisition of knowledge on the structure, importance, physiological action and recommended consumption of nutritious food and how to select and combine food as a source of nutritious substances; they are to be explained the concept of adequate nutrition and to be familiarized with specific features of nutritional needs of certain groups of people according to their age, intensity of everyday body activity, body mass, genetic predispositions, possible pathological conditions etc., as well as to present them current trends of healthy food.				
Course outcome: Upon the successfully completed course students will possess the knowledge of the structure, importance, physiological action and recommended consumption of nutritious food and how to select and combine food as a source of nutritious substances, and they will be able to explain the concept of adequate nutrition and specific features of nutritional needs of certain groups of people according to their age, intensity of everyday body activity, body mass, genetic predispositions, possible pathological conditions etc.				
Subjects content: <i>Lectures</i> Historical development of food and food science; basic types of nutritional components; proteins; carbohydrates; lipids; vitamins; minerals; energy and nutritional needs of people and their dependence on external and internal factors; principles of adequate nutrition; healthy food trends; functional food; types of food, general classification; the importance of water in nutrition; meat and meat products; milk and dairy products; bread, pastries, pasta and products from cereals; fruit and vegetables; sweets; spices, sauces, gravies etc.; teas; coffee; non-alcoholic beverages, carbonated beverages; beer; wine, strong alcoholic drinks; oriental food; types of nutrition depending on geographic region; ecological farming and growing (organic food); GMO food; nutrition and religion; meat avoiding nutrition regimes, vegetarian nutrition, vegan nutrition; Mediterranean nutrition; nutrition of pregnant women and breast-feeding women; nutrition of pre-school children, elementary school children, adolescents; nutrition of elderly persons; nutritional analysis of meals, possibilities of substitution of high-calorie meals with analogues; diet due to medical reasons, diet aimed at reduction of body mass, positive and negative examples from practice.				
<i>Exercises</i> Repetition of theory class lessons; basic types of nutritional components – presentation and discussion; types of food – presentation, discussion; organic food – discussion; GMO food – discussion; nutrition and religion – discussion; meat avoiding nutrition regimes, vegetarian nutrition, vegan nutrition – presentation, discussion; Mediterranean food – presentation; nutrition of pregnant women and breast-feeding women – presentation; nutrition of pre-school children, elementary school children, adolescents – presentation; nutrition of elderly persons – discussion; nutritional analysis of meals, possibilities of substitution of high-calorie meals with analogues – workshop; making menu for a certain case – project task; diet due to medical reasons, diet aimed at reduction of body mass, positive and negative examples from practice – workshop, discussion.				
Literature: <i>Literature in English:</i> - Ilić B.: Ishrana i dijetika, Visoka medicinska škola strukovnih studija iz Čuprije, 2014. - Novaković B., Jusupović F.: Ishrana i zdravlje, udžbenik, Medicinski fakultet, Novi Sad, 2014. - Alibabić V., Mujić I.: Pravilna prehrana i zdravlje, Veleučilište u Rijeci, Rijeka, 2016. - Trbović B., Nikolić M., Banković Paunović S.: Ishrana, udžbenik, Zavod za udžbenike, Beograd, 2014. - Smajić A.: Nutricionizam - ishrana stanovništva, Federalno ministarstvo poljoprivrede, vodoprivrede i šumarstva, Sarajevo, BiH, 2017. - Modić P.: Upotreba prehrambenih aditiva, Popo-knjiga, Beograd, 2001. - Petrović Malahov G.: Ishrana i hrana, IGP Prometej, Beograd, 2007. <i>Literature in Serbian:</i> - World Health Organisation: Nutrition, health and development, World Health Organisation, New York, 2000. - Mahan K. L., Escott-Stump S., Raymond J. L.: Krause's Food and Nutrition Care Process, Elsevier, St. Louis, Missouri, 2012.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0

Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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	30		
Colloquiums	30		

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: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. Beik Janet I.: Health Insurance Today: A Practical Approach, Saunders, Philadelphia, 2010. 2. 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. 3. Orrisey M. A.: Health Insurance, textbook, Health Administration Press, London, 2007. <i>Literature in Serbian:</i> 4. Ranković-Vasiljević R., Stojanović-Jovanović B., Terzić-Marković D.: Metodika i organizacija zdravstvene nege, Visoka zdravstvena škola strukovnih studija, Beograd, 2015. 5. Milović Lj.: Organizacija zdravstvene nege sa menadžmentom, udžbenik, Naučna knjiga, Beograd, 2004. 6. Tijanić M. i sar.: Zdravstvena nega i savremeno sestrinstvo, Naučna knjiga, Beograd, 2010.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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 professional 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: <i>Lectures:</i> 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. <i>Exercises:</i> 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: <i>Literature in English:</i> 1. Morrisey M. A.: Health Insurance, 1 st ed., Health Administration Press, New York, 2007. 2. Beik J. I.: Health Insurance Today: A Practical Approach, 3 rd ed., Saunders, Philadelphia, 2010. <i>Literature in Serbian:</i> 3. Milanović M.: Organizacija i istorija radiološke službe, udžbenik, Beograd, 2005. 4. Milanović M.: Organizacija i istorija radiološke službe, udžbenik, drugo dopunjeno izdanje, Beograd, 2013. 5. Milović Lj.: Organizacija zdravstvene nege sa menadžmentom, udžbenik, Naučna knjiga, Beograd, 2004. 6. Mićović P.: Zdravstveni menadžment, udžbenik, ECPD, Beograd, 2008. 7. Službeni glasnici Republike Srbije.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	15	0	0	0
Methods of teaching:				

interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, 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/exam	30		

PATHOPHYSIOLOGY

Study program:	Radiology			
Type and level of study:	undergraduate professional studies			
Course:	Pathophysiology			
Language of instruction:	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: <i>Lectures</i> 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, atherosclerosis, 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. <i>Exercises</i> 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, atherosclerosis, 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: <i>Literature in English:</i> 1. Huether S. E.: Understanding Pathophysiology, Elsevier, London, 2011. 2. Nolan A.: Pathophysiology: Step By Step Guide for Nursing, textbook, Kindle Edition, London, 2020. 3. Banasik J. L.: Pathophysiology, textbook, Saunders, New York, 2018. <i>Literature in Serbian:</i> 4. Radić S.: Opšta patofiziologija, udžbenik, Medicinski fakultet, Niš, 2012. 5. Beleslin B.: Specijalna patološka fiziologija, Beograd, 2008. 6. Babić Lj., Borota R., Lučić A.: Priručnik praktičnih i seminarskih vežbi iz patološke fiziologije, Medicinski fakultet, Novi Sad, 2007. 7. Ubavić M.: Patološka fiziologija, interne skripte, ICEPS, 2017. 8. Gamulin M., Marušić M., Kovač Z.: Patofiziologija, udžbenik, Medicinska naklada, Zagreb, 2005. 9. Maličević Ž. i sar.: Osnovi patološke fiziologije, udžbenik, Panevropski univerzitet Apeiron, Banja Luka, 2009. 10. Kovač Z., Gamulin S. i sar.: Patofiziologija, Zadaci za problemske seminare, Medicinska naklada, Zagreb, 2006. 11. Živančević-Simonović S.: Opšta patološka fiziologija, udžbenik, Medicinski fakultet, Kragujevac, 2002. 12. Dorđević-Denić G. i sar.: Specijalna patološka fiziologija, udžbenik, Zavod za izdavanje udžbenika, Beograd, 2003.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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: Serbian				
Course status: elective				
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: <i>Lectures</i> 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, immunosuppressives and immunostimulants; vitamin pharmacology; obesity treatment drugs; antimicrobe drug pharmacology; hormone pharmacology, antifungal drugs; antiviral drugs; amebicides; antimalarial drugs; antiparasitic drugs; antiseptics and disinfectants; chemotherapy of malignant diseases. <i>Exercises:</i> General principles and drug development. Work with pharmacologic databases on the internet. Drug division. Drug prescribing. Prescription.				
Literature: <i>Literature in English:</i> 1. 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. 2. Whalen K.: Lippincott Illustrated Reviews: Pharmacology, Wolters Kluwer Health, London, 2018. 3. Adams M. P., Holland N.: Pharmacology for Nurses: A Pathophysiologic Approach, textbook, Pearson, New York, 2016. <i>Literature in Serbian:</i> 4. Đaković Švajcer K.: Osnovi farmakologije, udžbenik, Ortomedics, Novi Sad, 2010. 5. Varagić V., Milošević M.: Farmakologija, udžbenik, Elit Medica, Beograd, 2005. 6. 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. 7. Stanimirović V. (ur.) i sar.: Farmakoterapijski vodič 4, Agencija za lekove i medicinska sredstva Srbije- pomoćni udžbenik na Farmaceutskom fakultetu u Beogradu, 2008. 8. Bukarica-Gojković Lj. i sar.: Praktikum iz farmakologije, Medicinski fakultet, Univerzitet u Beogradu, 2009. 9. Rang H. P., Dale M. M., Ritter J. M., Moore P. K.: Farmakologija, udžbenik, Data Status, Beograd, 2004. 10. 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.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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		

PSYCHOLOGY IN NURSING AND HEALTH CARE

Study program:	Radiology
Type and level of study:	undergraduate professional studies
Course:	Psychology in Nursing and Health Care
Language of instruction:	Serbian
Course status:	elective
Semester:	second year, fourth semester
ECTS:	5
Requirement:	no
Course objective: Acquisition of knowledge in psychology relating to the patient and his/her relatives at the moment of becoming aware of a health issue, the period of its solving, as well as in case of coping with severe or incurable diseases, their lasting consequences and similar situations. In addition to that, the course objective is to educate students in emotional and psychological states through which a medical professional may go through in the course of his/her work with patients. In addition to that, the objective of the course is for the student to acquire knowledge about the impact of psychological factors and the significance of stress in the development of psychosomatic disorders. They will also gain understanding of coping mechanisms for stress and pain management; as well as acquire knowledge that will enable them to recognize burnout syndrome in real-life professional environments, particularly within the health care sector, along with strategies to overcome it.	
Course outcome: Upon completion of the course and passing the exam, the student will gain knowledge of the psychology of patients and their families in the moment of health issue discovery, during the treatment process, and in uncertain situations. The student will also be trained in certain self-control techniques for managing emotional and psychological reactions they may experience as a health care professional while dealing with patients. Additionally, upon course completion, the student should be able to recognize and understand the health care psychology and theoretical models the course is based on; they should recognize psychological aspects of health and illnesses; to identify different psychological reactions to symptoms, illnesses and the importance of seeking professional help and social support; students will understand the role of stress in the development of psychosomatic illnesses and coping strategies; recognize the role of personal factors in experiencing and managing pain; understand the psychological aspects of severe illnesses and terminal condition; and to comprehend the psychological aspects of hospitalization in patients of different ages.	
Course content: <i>Lectures</i> Psychology of health and disease; accepting disease as a reality; determination in solving a health issue; psychology of a patient at the moment of becoming aware of his/her health issue and during treatment; psychological states in case of uncertainty, expectations, unexpected treatment, unsuccessful treatment, deterioration in diagnosis; work with patient's relatives, the role of relatives; support, openness in conversation, panic versus rationality; work with patient's relatives in case of poor prospects diagnosis, in case of a loss; work with medical professional in case of severe emotional states, patient being nervous, state of shock; social institutions, support of competent services; importance of communication; basics of occupational therapy; pain management; understanding the relation between the patient and health care professional; familiarization with the principles of health care habits development at different ages; the relationship between social support and health; review of models and strategies for promoting health related behaviors aimed at reducing health issues; recognition of burn out symptoms and the adoption of methods to overcome it, especially among those employed in health care. <i>Exercises</i> Accepting disease as a reality – workshop. Determination in solving a health issue – workshop. Psychology of a patient at the moment of becoming aware of his/her health issue and during treatment – workshop. Psychological states in case of uncertainty, expectations, unexpected treatment, unsuccessful treatment, deterioration in diagnosis – workshop. Work with patient's relatives – workshop. Work with medical professional in case of severe emotional states – workshop. Visits of professionals. Visits from representatives of institutions that provide psychological help to patients and employees (The Society of Psychologists of Serbia, the Institute of Mental Health, or the Psychopolis Institute).	
Literature: <i>Literature in English:</i> 1. Kubler Ross E.: On Death and Dying, Prentice Hall, 2001. 2. Friedman H. S.: Health psychology, textbook, Prentice Hall, 2003. <i>Literature in Serbian:</i> 3. Havelka M.: Zdravstvena psihologija. udžbenik, Jastrebarsko-Naklada Slap, 2008. 4. Kekuš D.: Komunikacije u profesionalnoj praksi zdravstvenih radnika, Digital Art, Beograd, 2010. 5. Payne S. H., Walker J.: Psihologija u zdravstveni negi, Educy, Ljubljana, 2002. 6. Berger D.: Zdravstvena psihologija, Društvo psihologa Srbije, Centar za primarnu psihologiju, Beograd, 2002. 7. Simić M., Kovačević K.: Mentalna higijena, udžbenik, autorsko izdanje, Beograd, 2004. 8. Milivojević Z.: Emocije, Psihopolis institut, Novi Sad, 2008. 9. Štajner K.: Školovanje srca, Psihopolis institut, Novi Sad, 2007. 10. Bern E.: Koju igru igraš, Beoknjiga, Beograd, 2003.	

11. Kekuš D.: Zdravstveno vaspitanje, Digital art, Beograd, 2009.
12. Ranković Vasiljević R.: Metodika i organizacija zdravstvene nege, Viša medicinska škola, Beograd, 2004.
13. Forvard S., Frejžer D.: Emocionalna ucena, Psihopolis institut, Novi Sad, 2011.
14. Haris A. T.: Ja sam OK- ti si OK, Beograd, 2003.
15. Džejms M.: Životni pobednik, Psihopolis institut, Novi Sad, 2008.

Number of classes:

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

Methods of teaching:

lectures, exercises, case study, 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	30		

PUBLIC HEALTH

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Public Health				
Language of instruction: Serbian				
Course status: elective				
Semester: first year, second semester				
ECTS: 5				
Requirement: no				
Course objective: The objective of the course is familiarization of students with measures, levels and organization of health care and their training for applying a social-medical approach in future practice, primarily in the field of nursing.				
Course outcome: Upon completion of the course, the students will be familiar with the principles of public health, health care politics, indicators of the population health status, classification systems in health care, and they will understand the functioning of the health care system, especially in the area of nursing, from the perspective of patients, health care professionals, health care institutions, the government, and society.				
Course content: <i>Lectures</i> The development and definition of social medicine; health and quality of life; social care of health; communication in health care; health protection; social inequalities in health care and obtaining health protection; vulnerable categories; health care policy; criteria for evaluation of socio-medical importance of health issues; methods of prevention and control of chronic non communicative diseases; health protection systems around the world; health protection programming; the role of health care institutions and health care professionals in the system of health care protection; health care technology; quality of health protection; classification systems in health care; management in health care; <i>Exercises</i> The analysis of public health aspects on the quality of life in the country and society. Comparative analysis of segments studied in public health and social medicine. Analysis of solutions to identical or similar situations in countries of the region and the European Union.				
Literature: <i>Literature in English:</i> 1. 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. 2. Morrissey M. A.: Health Insurance, Health Administration Press, London, 2007. 3. Schneider M. J.: Introduction to Public Health, textbook, Jones-Barlett learning, New York, 2021. 4. Murphy F.: Community Engagement, Organization, and Development for Public Health Practice, Springer Publishing Company, New York, 2004. <i>Literature in Serbian:</i> 5. Lazarević A. i sar.: Javno zdravlje, socijalna politika i zdravstvena zaštita, udžbenik, Beograd, Visoka zdravstvena škola strukovnih studija, Beograd, 2016. 6. Hojer S.: Pristupi i metode u zdravstvenom odgoju, udžbenik, Koledž zdravlja, Ljubljana, 2005. 7. Lazarević A.: Socijalna medicina, autorsko izdanje, Beograd, 2015. 8. Simić S. i sar.: Socijalna medicina, udžbenik, Medicinski fakultet, Beograd, 2012.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (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	Exam	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: Serbian				
Course status: elective				
Semester: third year, sixth semester				
ECTS: 5				
Requirement: no				
Courses objective: The objective of the course is to understand the concept and essence of quality as a market category, to recognize the specific characteristics of quality within a work organization, with special emphasis on the particularities of service in a specific sector, and to become familiar with the basics of institutional organization, methods of institutional management, specificities of decision-making processes, administrative procedures, and change management within the institution. The objective also includes understanding and accepting the concept of standardization and the importance of standards in the process of defining quality.				
Course outcome: After attending and passing the course, the student should be qualified to practically apply internal procedures and standards for the purpose of establishing and controlling the quality of services, to determine and rank quality criteria, to master techniques and methods for measuring and controlling quality, and to evaluate the application of established standards, with a special focus on the type of organization they belong to. Additionally, the student should be trained in how to adopt and implement corrective measures aimed at quality management.				
Course content: <i>Lectures</i> Quality management: concept, definition of quality, reasons for implementing quality control processes. Characteristics of quality in specific areas (e.g., specifics of quality control in healthcare...), forms and levels of quality manifestation. Quality management systems: definition and development of various quality systems. Service standardization as the basis of quality, areas of standard application, types of standards. Requirements of ISO 9000, ISO 9001, ISO 14000, ISO 22000 standards; implementation of the HACCP system, HALAL standards. The importance of internal procedures within an organization. Management chain. The role of employees in ensuring quality, the importance and role of human resources, the human resource management process. The importance and role of management in achieving quality, managers as quality factors. The role of service users in creating service quality: perception, deviations, satisfaction, methods for measuring service quality. Strategic approach to quality, trends in business orientation of companies, changes in the structure of offerings. Strategic adaptation of services to modern trends: market segmentation, differentiation, positioning, application of modern technologies. <i>Exercises</i> Discussion on topics related to institutional organization and quality control processes. Analysis of practical experiences in Serbia and abroad. Visit by a certified ISO evaluator. Visit by a manager from a public or private company that implements quality control effectively. Analysis of practical examples from domestic and foreign, public and private healthcare organizations. Analysis and practical examples from the field of safety. Employee and client safety, discussion.				
Literature: <i>Literature in English:</i> 1. Spath P.: Applying Quality Management in Healthcare: A Systems Approach, textbook, Health Administration Press, Boston, 2017. 2. Morrissey Michael A.: Health Insurance, 1st ed., Health Administration Press, 2007. 3. Swanwick T., Vaux E.: ABC of Quality Improvement in Healthcare, Wiley, New York, 2020. <i>Literature in Serbian:</i> 4. Kancir D., Antić Z.: Menadžment kvaliteta, Beogradska poslovna škola - Visoka škola strukovnih studija, Beograd, 2013. 5. Blešić I.: Menadžment kvaliteta u turizmu i hotelijerstvu, Prirodno-matematički fakultet, Novi Sad, 2017. 6. Legetić B.: Principi menadžmenta, udžbenik, Ekonomski fakultet, Subotica, 2007. 7. Milović Lj.: Organizacija zdravstvene nege sa menadžmentom, udžbenik, Naučna knjiga, Beograd, 2004. 8. Marinković Lj.: Menadžment u zdravstvenim organizacijama, G.A.D. Beograd, 2001. 9. Mićović P.: Zdravstveni menadžment, Obeležja, Beograd, 2008. 10. Službeni glasnici Republike Srbije. 11. Grujić V., Martinov Cvejin M., Legetić B.: Menadžment u zdravstvu, udžbenik, Medicinski fakultet, Novi Sad, 2007. 12. Grujić V., Martinov-Cvejin M., Legetić B.: Ekonomika zdravstva, Medicinski fakultet, Novi Sad, 1993. 13. Probbins S., Judge T.: Organizaciono ponašanje, Mate, Zagreb, 2009.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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 professional 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: <i>Lectures:</i> 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. <i>Exercises:</i> 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: <i>Literature in English:</i> 1. Douglas McGregor, J. Kenneth Shultis: Radiation Detection, Concepts, Methods, and Devices, CRS, London, 2020. <i>Literature in Serbian:</i> 2. Milanović, M.: Rendgen aparati i uređaji za dijagnostiku, udžbenik, Visoka medicinska škola, Beograd, 2003. 3. Živković M.: Klinička radiologija 1, udžbenik, Sportska knjiga, Beograd, 2000. 4. Milanović M.: Rendgen aparati i uređaji, udžbenik, autorsko izdanje, Beograd, 2012.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
30	75	240	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of practical examples, case study, discussion, 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	30			
Colloquiums/exam	30			

RADIATION PROTECTION

Study program: Radiology				
Type and level of study: undergraduate professional 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: <i>Lectures:</i> 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. <i>Exercises:</i> 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: <i>Literature in English:</i> 1. 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. <i>Literature in Serbian:</i> 2. Jovanović T., Paunović K.: Osnovi radiološke zaštite, udžbenik, Visoka medicinska škola, Beograd, 2005. 3. Marković S., Spaić R.: Zdravlje i društvo, Zavod za biomedicinsko inženjerstvo i medicinsku fiziku SR Jugoslavije, Beograd, 2001. 4. Dodig D. i sar.: Radijacijske ozljede, Medicinska naklada, Zagreb, 2002.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
45	30	30	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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	30		
Colloquiums/exam	30		

RADIOLOGY PHYSICS AND BASICS OF RADIOLOGY WORK METHODS

Study program: Radiology				
Type and level of study: undergraduate professional 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 to acquire knowledge about X-ray machines and devices, their components and the functions they perform, as well as the methods of their use.				
Course outcome: Upon completion of the course, the student should have mastered knowledge of X-ray equipment and other devices, which they can apply in practice; be familiar with X-ray machines and devices, their components, and the functions they perform; have acquired the basic skills for operating X-ray machines and devices and using them for diagnostic purposes; be able to explain the physical and technical principles of computed tomography, magnetic resonance imaging, nuclear medicine techniques (PET and SPECT devices), and the use of ultrasound machines; be able to connect these principles with patient protection, image quality, and artifacts; understand and be able to critically assess the factors that affect the quality of radiographic images; understand how to read and interpret operating instructions and accompanying documentation for X-ray machines and devices; understand the relationship between exposure parameters and the type of examination or patient size; understand how and why different factors influence the amount of secondary radiation and discuss their impact on image quality and radiation dose; as well as know how to adjust the parameters of X-ray and computed tomography equipment in accordance with the type of examination and the size of the patient.				
Course content: <i>Lectures:</i> X-ray machines through history. Modern X-ray tubes. Tube housing and cooling systems. X-ray machine generators. Control console and automatic exposure control. Radiological stands: standard and special. Radioscopy and image acquisition on screens. Remote-controlled, mobile, mammographic, dental, and other X-ray systems. Angiographic equipment and devices used in angiography suites. Computed tomography scanners, single-slice and multi-slice. Magnetic resonance imaging systems. Ultrasound diagnostic devices. Digital radioscopy, FLAT-PANEL detectors. DICOM standard and computer communication networks. Comparative analysis of similar radiological techniques and method selection. Computed tomography, magnetic resonance imaging, mammography, ultrasound. Nuclear medicine technology. <i>Exercises:</i> Practical exercises follow the theoretical teaching units through hands-on and demonstration work in real conditions at the Teaching Base. Students become familiar with and operate various X-ray machines and devices, learning their proper use and handling. They are introduced to practical work with mammography units, craniography equipment, remote-controlled systems, mobile X-ray units, dental X-ray machines, and others. Training covers work techniques, the use of fluoroscopy, and the production of various types of images. Students also gain experience in practical work with computed tomography (CT) scanners, magnetic resonance imaging (MRI) systems, and ultrasound diagnostic devices. Practical exercises include work with angiography equipment and other devices in the angiography suite.				
Literature: <i>Literature in English:</i> 1. Walter Huda: Review of Radiologic Physics, LWW, New York, 2016. 2. Andrea S. Doria, George Tomlinson, Joseph Beyene, Rahim Moineddin: Research Methods in Radiology: A Practical Guide, Thieme, Amsterdam, 2014. 3. 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. <i>Literature in Serbian:</i> 4. Simonović J., Vuković J., Ristanović D., Radovanov R., Popov D.: Biofizika u medicini, udžbenik, Medicinska knjiga, 2003. 5. Stanković J., Milošević N.: Osnovi radiološke fizike, udžbenik, Visoka medicinska škola, Beograd, 2007. 6. Milanović M.: Organizacija i istorija radiološke službe, udžbenik, Visoka med. škola, Beograd, 2005. 7. Babić L.: Zdravstvena nega u radiologiji, udžbenik, Licej, Beograd, 2011. 8. Stojković B.: Zdravstvena nega u radiologiji, Naučna knjiga, Beograd, 2006.				
Number of classes (in semester):				
Lectures	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
15	60	0	0	0

Methods of teaching: interactive classes, demonstration, practical exercises, analysis of practical examples, 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		

RARE DISEASES

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Rare Diseases				
Language of instruction: Serbian				
Course status: elective				
Semester: second year, fourth semester				
ECTS: 5				
Requirement: no				
Course objective: The objective 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: <i>Lectures</i> 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 European Medicines Agency labeling relating to medicines for treatment of rare diseases to obtaining permit for the European market; "assistance in diagnosis" option as an 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.				
<i>Exercises</i> 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: <i>Literature in English:</i> 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. <i>Literature in Serbian:</i> 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	Other forms of teaching (individual work with student, projects...)
30	30	0	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, e-learning.				
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: Serbian				
Course status: elective				
Semester: third year, sixth semester				
ECTS: 5				
Requirement: no				
Course objective: To equip students with the necessary skills for professional, scientific-research, and bibliographic-research work.				
Course outcome: Possession of necessary knowledge that will enable students to engage in professional, scientific-research, and bibliographic-research work.				
Course content: <i>Lectures</i> Importance of scientific work. Difference between scientific and professional work. Stages of professional, scientific-research, and bibliographic-research work. Selection of topic and formulating a hypothesis. Selection of research methodology. Literature review. Methods of citing literature. Experiment. Surveys and processing of survey results, data protection. Statistical data processing. Quality of the sample. Objectivity and subjectivity. Result, discussion and conclusion. Structure and writing of professional and scientific work. Types of professional and scientific papers. Valuation of professional and scientific papers. Ways of professional and scientific paper publishing. Citation. Plagiarism. Protection of data. Methodology for preparing seminar and final papers. <i>Exercises</i> Techniques of collecting, organizing, and studying literature, as well as citing literature according to prescribed standards. Searching selected electronic databases. Processing research results. Graphical representation of data. Mastery of computer programs for writing and formatting texts (Word – MS Office), correct naming of tables, images, charts, and diagrams. Writing professional and scientific papers. Citing literature. Preparing a seminar paper. Principles of preparing a final paper, familiarizing with the procedure for preparing a final paper, simulation of preparing a final paper.				
Literature: <i>Literature in English:</i> 1. Ebel H. F., Bliefert C., Russey W. E.: The art of scientific writing, Wiley-VCH, Verlag GmbH & Co. KGaA, Weinheim, 2004. <i>Literature in Serbian:</i> 2. Milankov V., Jakšić P.: Metodologija naučno-istraživačkog rada u biološkim disciplinama, udžbenik, Prirodno-matematički fakultet, Novi Sad, 2006. 3. Šomodi Š., Novković N., Kraljević-Balalić M., Kajari K.: Uvod u naučni rad, udžbenik, Poljoprivredni fakultet, Novi Sad, 2004.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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 professional 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: <i>Lectures:</i> 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 various 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. <i>Exercises:</i> Exercises are compatible with lectures and theoretical unit and they include practical work and demonstrations in the teaching base.				
Literature: <i>Literature in English:</i> 1. Wicke L., Firbas W., Schmiedl R.: Atlas of Radiologic Anatomy, 4th ed., Munich, Baltimore: Urban & Schwarzenberg, Maryland, 1987. 2. 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. 3. Carlton R., Adler A.: Principles of Radiographic Imaging, Delmar Thomson Learning, New York, 2001. 4. Fauber T. L.: Radiographic Imaging & Exposure, Mosby Elsevier, St. Louis, 2009. <i>Literature in Serbian:</i> 5. Živković M.: Klinička radiologija 1, udžbenik, Sportska knjiga, Beograd, 1992. 6. Udovičić B., Bulatović R.: Radiografske tehnike i radiološka anatomija, autorizovana skripta, Beograd.				
Number of classes:				
Lecture	Exercises	Other classes (professional practice...)	Study research work	Other forms of teaching (individual work with student, projects...)
45	60	300	0	0
Methods of teaching: interactive classes, demonstration, practical exercises, analysis of examples from practice, case studies, discussion, 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	30			
Colloquiums/exam	30			

SPECIALIZED ENGLISH FOR MEDICINE 1

Study program: Radiology				
Type and level of study: undergraduate professional studies				
Course: Specialized English for Medicine 1				
Language of instruction: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. MacLean J.: English in Basic Medical Science, Oxford University Press, Oxford, 2000. 2. 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. 3. Murphy R.: English Grammar in Use, Cambridge University Press, Cambridge, 2014. 4. McCarthy M., O'Dell F.: English Vocabulary in Use, Cambridge University Press, Cambridge, 2006. 5. Hornby A.S.: Oxford Advanced Learner's Dictionary of Current English, Oxford University Pres, Oxford, 2008. <i>Literature in Serbian:</i> 6. Dragović R.: Engleski za zdravstvene radnike, udžbenik, Naučna knjiga, Beograd, 2004.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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: 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: <i>Lectures</i> 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. <i>Exercises</i> 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: <i>Literature in English:</i> 1. MacLean J.: English in Basic Medical Science, Oxford University Press, Oxford, 2000. 2. 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. 3. Murphy R.: English Grammar in Use, Cambridge University Press, Cambridge, 2014. 4. McCarthy M., O'Dell F.: English Vocabulary in Use, Cambridge University Press, Cambridge, 2006. 5. Hornby A.S.: Oxford Advanced Learner's Dictionary of Current English, Oxford University Pres, Oxford, 2008. <i>Literature in Serbian:</i> 6. Dragović R.: Engleski za zdravstvene radnike, udžbenik, Naučna knjiga, Beograd, 2004.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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: Serbian				
Course status: elective				
Semester: first year, first semester				
ECTS: 5				
Requirement: no				
Course objective: The aim of the course is to improve a range of language knowledge, abilities, and skills, with a particular focus on business, so that students can independently interpret specialized texts, communicate competently in a business context, and write short texts in German on their own.				
Course outcome: The student acquires the vocabulary of general and business language, is aware of the diversity of linguistic means and actively applies them in both general and business contexts; reviews and deepens knowledge across all levels of language structure (phonetics, morphology, syntax, semantics); develops all language skills (reading, listening, writing, speaking); uses acquired knowledge for further independent language learning; develops sociolinguistic and strategic competence; independently uses printed and electronic dictionaries; and masters economic technical terminology through thematic texts and other materials from courses attended during their studies.				
Course content: <i>Lectures</i> Grammar: personal pronouns; present tense; question words (W-Fragen); definite and indefinite articles; modal verbs in the present tense; imperative; possessive pronouns; time prepositions; preterite (sein, haben); polite forms (würde, könnte); comparison of adjectives. Text analysis in German: introductions and self-presentation in various situations, numbers and telling time, daily work-related activities, restaurant situations with business partners, company visits and relationships with business partners, business trips and their organization (booking tickets, accommodation, purchasing appropriate clothing), navigating the city, inviting, canceling, or postponing business meetings. Interpreting data from timetables, road maps, company charts, classified ads, and manufacturers' offers. Selection of texts in accordance with the chosen module – group work. <i>Exercises</i> Practicing grammatical structures of the German language through speaking situations and acquiring specific vocabulary. Developing all language skills (reading, writing, speaking, understanding written and spoken texts). Simulating conversations on covered topics – workshop. Presenting a company, its activities and organization – workshop. Selection of texts in accordance with the chosen module – group work.				
Literature: <i>Literature in German:</i> 1. Pude E. A., Specht F.: Menschen, Deutsch als Fremdsprache Kursbuch mit DVD-ROM, udžbenik, Hueber Verlag, Munchen, 2012. 2. Loibl B. et al.: Schritte Plus im Beruf, Kommunikation am Arbeitsplatz, Max Hueber Verlag, Ismaning, 2015. 3. Becker N., Braunert J.: Alltag, Beruf, Kursbuch+Arbeitsbuch, Max Hueber Verlag, Ismaning, 2009. 4. Becker N., Braunert J., Schlenker W.: Unternehmen Deutsch Grundkurs. Kursbuch, Klett Verlag, Stuttgart, 2005. 5. Becker N., Braunert J.: Unternehmen Deutsch Grundkurs, Arbeitsbuch, KlettVerlag, Stuttgart, 2004. 6. Grammatik - Ganz klar Übungsgrammatik A1-B1, uz audio materijal, Hueber Verlag, 2011.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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: Serbian				
Course status: elective				
Semester: second year, third semester				
ECTS: 5				
Requirement: Specialized German for Medicine 1				
Course objective: The objective of the course is the further improvement of language knowledge, abilities, and skills, with a particular focus on business topics, at a higher level compared to Specialized German for Medicine 1 (previous course).				
Course outcome: The student continues to acquire vocabulary of general and business language and actively applies it in both general and business contexts, at a higher level than in Specialized German for Medicine 1 (previous course). The course includes revision and deepening of knowledge across all levels of language structure (phonetics, morphology, syntax, semantics) and further development of the language skills: reading, listening, writing, and speaking. Mastery of professional terminology through theme-based texts that are more complex than those in the previous course.				
Course content: <i>Lectures</i> Grammar at a higher level than in Specialized German Language 1 for Medicine (previous course): personal pronouns in dative and accusative, preterite of modal verbs, perfect tense, prepositions of place and distinction between dative and accusative, irregular comparison of adjectives, word order in subordinate clauses. Analysis of German-language texts that are grammatically and lexically more complex than in the previous course. Selection of texts according to the chosen module – group work. Analysis of business texts in German from real companies. Analysis of business texts from the internet. Analysis of business texts in German from the German press. Listening to news broadcasts (daily news) in German. Presentation of companies and hierarchical structure. Presentation of companies and products. Hotel reservations and appointment scheduling, contacts at congresses, events, meetings, trade fairs. Product promotion. Formulating inquiries, offers, orders, complaints, and written responses to the above. Interpreting job advertisements, writing CVs, résumés, and job applications. <i>Exercises</i> Practice of German grammatical structures covered in theoretical instruction: reading, writing, speaking, understanding written and spoken texts. Selection of texts that are more complex than in the previous course. Simulation of conversations on the covered topics – workshop. Selection of texts according to the chosen module – group work.				
Literature: <i>Literature in Serbian:</i> 1. Pude E. A., Specht F.: Menschen, Deutsch als Fremdsprache Kursbuch mit DVD-ROM, udžbenik, Hueber Verlag, Munchen, 2012. 2. Loibl B. et al.: Schritte Plus im Beruf, Kommunikation am Arbeitsplatz, Max Hueber Verlag, Ismaning, 2015. 3. Becker N., Braunert J.: Alltag, Beruf, Kursbuch+Arbeitsbuch, Max Hueber Verlag, Ismaning, 2009. 4. Becker N., Braunert J., Schlenker W.: Unternehmen Deutsch Grundkurs. Kursbuch, Klett Verlag, Stuttgart, 2005. 5. Becker N., Braunert J.: Unternehmen Deutsch Grundkurs, Arbeitsbuch, KlettVerlag, Stuttgart, 2004. 6. Grammatik - Ganz klar Übungsgrammatik A1-B1, uz audio materijal, Hueber Verlag, 2011.				
Number of classes:				
Lectures	Exercises	Other classes (professional practice...)	Study research work	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			