DEFENCE UNIVERSITY IN BELGRADE
MILITARY MEDICAL ACADEMY

MEDICAL FACULTY

Study program guidelines

HISTORY

The development of Military Medical Services in Serbia started during the reign of Prince Milos Obrenovic, when, in 1836, Soldaski špitalj was founded. In accordance with the Principality of Serbia's Council, Prince Aleksandar Karadjordjevic had passed the Act on establishment of the Central Military Hospital on 2 March 1844 the forerunner of today's Military Medical Academy (MMA). This is the Day of Military Medical Academy nowadays. In the 20th century Central Military Hospital several times changed the name. In 1930 it received the name Main Military Hospital and its doctors were, mainly, the founders and lecturers of the Faculty of Medicine in Belgrade. After World War II, in 1950, by acts of the highest authorities of the former Yugoslavia, the Military Medical Academy was established as the highest military-medical, scientific and research institution and a center for postgraduate studies, which was officially confirmed by a special law in April 1960.

The Military Medical Academy provided the post-graduate studies for Msc and PhD degrees as well as medical specializations and sub-specializations in the field of medicine, dentistry and pharmacy until the new Law on Higher Education of the Republic of Serbia in 2005. As the new Law stipulated for the post-graduate forms of education to be provided only in the higher education institution thus the Ministry of Defence in order to harmonize the higher education in the defence system initiated the accreditation of the study military-educational programs and establishment of the University of Defence. Accordingly, MMA enrolled the first class of cadets in the school year 2009/2010 after having accredited the integrated academic studies of medicine within the Higher School MMA and obtaining the license for work on 20 May, 2009. Accrediting the academic specialist studies and academic PhD studies in the field of medicine along with the foundation of the University of Defence, the Higher School of MMA grew into the Medical Faculty of the Military Medical Academy and became the organizational unit of the University of Defence in Belgrade.

The MMA Medical Faculty of the University of Defence in Belgrade applies the contemporary approaches and knowledge in the field of medical sciences through the organization and realization of education in the defence system. The MMA Medical Faculty being such is a unique in the country and region comprising medical and military vocation.

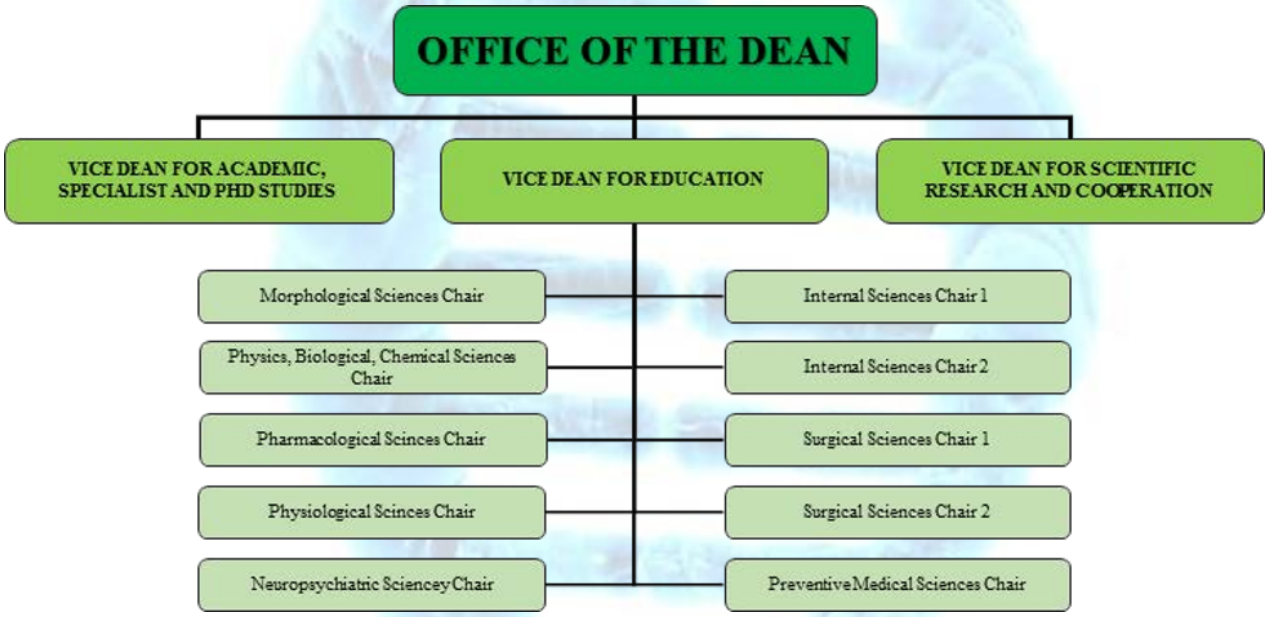
MISSION

The mission of the MMA Medical Faculty is to provide cadets and students with top-quality education in the field of medical sciences, encouraging their research spirit, independence and responsibility in work so they could as experts in various fields of medical sciences and profession contribute with their skills and knowledge to promoting the military healthcare and be committed academic citizens.

VISION

The vision of the MMA Medical Faculty is to produce the academic citizens who would be by their skills equal to the European and world experts in the field of medicine, especially military medicine.

MMA MEDICAL FACULTY ORGANIZATIONAL CHART



STUDY PROGRAMS

Basic vocational studies of medicine, integrated academic studies of medicine, nine academic specializations, and five modules of PhD studies are currently accredited.

MMA Medical Faculty uses clinics and institutes of MMA as its teaching base where at the same time classrooms and practicing rooms are. Providing support to Medical Faculty, MMA puts all resources in the logistics domain, as well as library and informatics at cadets' disposal.

I degree studies
Basic vocational Studies of Medicine
(3years; 180 ECTS)

I and II degree studies
Integrated Academic Studies of Medicine
(6years; 360 ECTS)

II degree studies
Specialist Academic Studies of Medicine
(1 year; 60 ECTS)

III degree studies
PhD Academic Studies of Medicine
(3 years; 180 ECTS)

BASIC VOCATIONAL STUDIES OF MEDICINE

The goals of education at basic vocational studies are to create competent and quality professionals who have acquired the highest professional and ethical standards required for the independent work in the institutions of primary, secondary and tertiary level of health care protection. Every study program course is expressed in credits and the scope of studies equals their sum of credits. The sum of 60 ECTS responds to the average student's engagement of minimum 40 lessons per week during one school year. Every course has certain credit value in accordance with the European Credit Transfer System (ECTS), as well as final paper and performed professional practice. Teaching of all courses is conducted in the form of lectures, practicals, tutorials, seminars, demonstrations, consultations. Practical teaching is conducted in small groups supervised by teachers and teaching associate. Basic vocational studies last 3 years (6 semesters) and have 180 ECTS credits. The MMA Medical Faculty has accredited one study program of this study level – vocational nurse (50 students).

VOCATIONAL NURSE

This study program consists of 31 compulsory courses, 12 electives out of which a student elects 6, 3 compulsory professional practices and a final paper. Upon the end of a study program and passed final exam, written final paper and oral presentation a student is conferred the degree of vocational nurse. Students who complete studies for a vocational nurse are capable to work independently and in team within the health care in all specialist disciplines, to apply accurately all diagnostic and therapeutic procedures, to prepare the equipment, tools and materials for health care procedures' implementation, to recognize a disease by the adequate interpretation of signs and symptoms, to observe principles of aseptic work, to apply emergency medical procedures in accordance with their competancies, to conduct principles of healthcare/educational work, to apply security principles and work safety, to keep the medical records, to follow up innovations and apply them in practice, to follow up and realize educational programs and to transfer their knowledge continuously, to participate in research and publish their papers.

FIRST STUDY YEAR					
	Course	**S**	**CS**	**ECTS**	
1	Anatomy and physiology	I	✔	5	
2	Clinical pharmacology and toxicology	I	✔	4	
3	Healthcare	I	✔	7	
4	English language 1	I	✔	3	
5	Pathology and pathophysiology	I	✔	3	
6	Microbiology	I	✔	3	
7	Public health and social medicine	II	✔	4	
8	Internal medicine	II	✔	5	
9	Healthcare in internal medicine	II	✔	5	
10	Psuchology with medical ethics	II	✔	4	
11	Hygiene with medical ecology	II	✔	3	
12	Medical statistics and informatics	II	( )	4	8
13	Basics of pedagogy and andragogy	II	( )	4	
14	History of Serbian Medical Corps and nursing	II	( )	4	
15	Health and work safety	II	( )	4	
16	Professional practice 1	II	✔	6	

Total	60

SECOND STUDY YEAR					
	Course	**S**	**CS**	**ECTS**	
1	Surgery	III	✔	5	
2	Healthcare in surgery	III	✔	5	
3	Neurology	III	✔	4	
4	Healthcare in neurology	III	✔	5	
5	Infectology and epidemiology	III	✔	3	
6	Healthcare in infectiology	III	✔	4	
7	Application of standard procedures in nursing	III	( )	4	4
8	Organization of healthcare with management	III	( )	4	
9	Psychiatry	IV	✔	4	
10	Healthcare in psychiatry	IV	✔	5	
11	Communication skills	IV	✔	3	
12	Emergency conditions and transfusiology	IV	✔	5	
13	English Language 2	IV	✔	3	
14	First aid	IV	( )	4	4
15	Prevention and control of nosocomial infections	IV	( )	4	
16	Professional practice 2	IV	✔	6	
Total				60	

THIRD STUDY YEAR					
Р.Б	**Course**	**S**	**CS**	**ECTS**	
1	Gynecology and Obstetrics	V	✔	3	
2	Healthcare in gynecology and obstetrics	V	✔	4	
3	Pediatrics	V	✔	3	
4	Healthcare in pediatrics	V	✔	4	
5	English Language 3	V	✔	3	
6	Medicine in emergency events	V	( )	4	8
7	Nutrition and dietetics	V	( )	4	
8	Helathcare in geriatry	V	( )	4	
9	Healthcare in rehabilitation	V	( )	4	
10	Healthcare in oncology	VI	✔	4	
11	Palliative care and pain management	VI	✔	4	
12	Healthcare in primary healthcare protection	VI	✔	3	
13	Reserch methodology in nursing	VI	✔	3	
14	Clinical practice	VI	✔	9	
15	Final paper	VI	✔	12	
Total				**60**	

S – Semester CS – Course status ✔ (Compulsory) ( ) (Elective)

INTEGRATED ACADEMIC STUDIES

The integrated academic studies last 6 years (12 semesters) and are worth 360 ECTS. Curriculum is based on three postulates. The first one is a core existing on all medicine studies consisting of 43 compulsory courses. The second is a large number of different electives, in total 27. The third is based on acquiring broad knowledge and a variety of skills which are indispensable to their future vocation in the field of medicine, primarily in the organization and management of a large number of people affected by natural disasters and mass accidents, due to chemical, biological and nuclear agents, all these issues, as a form of terrorism the modern world faces more frequently nowadays.

FIRST STUDY YEAR					
	Course	**S**	**CS**	**ECTS**	
1	Anatomy 1	I	✔	13	
2	Human Genetics	I	✔	7	
3	Medical Chemistry	I	✔	6	
4	First Aid	I	✔	3	
5	English Language 1	I	○	3	3
6	Medical Psychology	I	○	3	
7	Cell Biology	I	○	3	
8	Anatomy 2	II	✔	10	
9	Hystology & Embriology 1	II	✔	8	
10	Biophysics	II	✔	4	
11	Medical Ethics	II	✔	3	
12	Phylosophy and History of Medicine	II	○	3	3
13	History of Serbian Medical Corps	II	○	3	
14	English Language 2	II	○	3	
Total				**60**	

SECOND STUDY YEAR					
	COURSE	**S**	**CS**	**ECTS**	
1	Histology & Embriology 2	III	✔	7	
2	Medical Physiology	III+IV	✔	17	
3	Medical Biochemistry	III+IV	✔	13	
4	Medical Statistics and Informatics	III	✔	4	
5	Introduction to clinical Work	III	✔	3	
6	English Language 3	III	( )	3	3
7	Biomedical Instrumentation	III	( )	3	
8	Medical Microbiology	IV	✔	7	
9	Physical Education & Health	IV	( )	3	3
10	English Language 4	IV	( )	3	
11	Professional Practice – Healthcare	IV	✔	3	
Total				**60**	

THIRD STUDY YEAR					
	COURSE	**S**	**CS**	**ECTS**	
1	Pathology	V+VI	✔	14	
2	Pharmacology	V+VI	✔	11	
3	Epidemiology	V	✔	4	
4	Pathophysiology	V	✔	12	
5	Fundamentals of Immunology	V	✔	4	
6	Communication Skills	V	( )	2	4
7	Scientific Method	V	( )	2	
8	Medicine Based on Evidence	V	( )	2	
9	Nuclear Medicine	VI	✔	3	
10	Internal Propedeutics	VI	✔	5	
11	Adjustment to Extreme Conditions	VI	( )	3	3
12	Nutrition & Health	VI	( )	3	
Total				**60**	

FOURTH STUDY YEAR					
	COURSE	**S**	**CS**	**ECTS**	
1	Internal Medicine	VII+VIII	✔	18	
2	Neurology	VII	✔	6	
3	Radiology	VII	✔	5	
4	Infectious & Tropical Diseases	VIII	✔	8	
5	Clinical Biochemistry	VII	↻	3	3
6	Clinical Genetics	VII	↻	3	
7	Psychiatry	VIII	✔	5	
8	Dermatovenerology	VIII	✔	5	
9	Clinical Toxicology	VIII	✔	4	
10	Neurosciences	VIII	↻	3	3
11	Aviation medicine	VIII	↻	3	
12	Molecular Immunology	VIII	↻	3	
13	Professional Practice – Internal Medicine	VIII	✔	3	
Total				**60**	

FIFTH STUDY YEAR					
	COURSE	**S**	**CS**	**ECTS**	
1	Surgery	IX+X	✔	15	
2	Gynecology & Obstetrics	IX+X	✔	8	
3	Hygiene with Medical Ecology	IX	✔	5	
4	Transfusiology	IX	✔	3	
5	Anesthesiology and Intensive Care	IX	✔	3	
6	Pharmaceutical Medicine	IX	↻	3	3
7	Clinical Oncology	IX	↻	3	
8	Emergency Situations Medicine	X	✔	5	
9	Occupational Medicine	X	✔	3	
10	Emergency Medicine	X	✔	5	
11	Phytotherapy	X	↻	3	3
12	Immunologic Foundations of Transplantation	X	↻	3	
13	Professional Practice – Surgery	X	✔	3	
14	Professional Practice – Gynecology & Obstetrics	X	✔	4	
Total				**60**	

SIXTH STUDY YEAR				
	COURSE	**S**	**CS**	**ECTS**
1	Pediatrics	XI-XII	✔	11
2	Ophthalmology	XI	✔	6
3	Otorhinolaryngology with Maxillofacial Surgery	XI	✔	6
4	Physical Medicine and Rehabilitation	XI	✔	4

5	Palliative Medicine	XI	( )	3	6
6	Clinical Thrombosis and Haemostasis	XI	( )	3	
7	Oral Medicine	XI	( )	3	
8	Forensic Medicine	XII	✔	4	
9	Clinical Pharmacology	XII	✔	3	
10	Public Health and Social Medicine	XII	✔	3	
11	Clinical Rotations	XII	✔	5	
12	Final Diploma Paper	XII	✔	12	
Total				**60**	

S – Semester CS – Course Status ✔ (Compulsory) ( ) (Electives)

Candidates who have the Serbian citizenship and who completed the grammar school or secondary medical or veterinary school of four years duration could apply. All candidates will have the physical ability test, compulsory medical examination and psychological testing before the entrance exam that is the same as for all state owned medical faculties. These tests are eliminatory and only candidates who meet the criteria could proceed with the entrance exam in biology and chemistry. After testing all prospective applicants are ranked based on the evaluation of the secondary school grades (overall average over the continuum of all 4 years of the secondary school education comprising all the grades and the final exam, maximum number of points 40) as well as number of points accomplished at the entrance exam in biology and chemistry (maximum number of points 60). To pass the exam, an applicant has to answer correctly to at least 16 questions from each subject and have the total of 60 correct answers (50% + 1 point from each subject). Being a member of the Medical Faculties of Serbia's community, the Faculty should organize the entrance exam on the same day and hour as all other Medical Faculties in the country.

Obligations and rights of cadets are stipulated by the contract, cadets have a status of military staff, they have a military training, and they are on the budget, housed in the boarding school of the Military Academy. It is envisaged that cadets on the fifth and sixth year be housed in the boarding school of the Military Medical Academy so that they can have an easier access to the clinics and to master more efficiently the practical work with patients.

Teaching is interactive, and cadets have the possibility to work in small groups. Throughout their studies, each cadet has a mentor to encourage, guide and advise cadets.

Extracullicular activities are not compulsory but can contribute to higher quality social life of cadets during their studies. Those activities are realized through cadets' engagement in various sports at the Military Academy as well as attending the various courses of foreign languages.

Upon completion of education, cadets go into the professional military service which is defined by the contract. After graduation, and a certain period of service in the military garrison units as General Practicionaries they could apply for specializations.

SPECIALIST ACADEMIC STUDIES

Upon graduation, medical doctors (MD) face many challenges which can define their decision for further specializations. Knowledge and skills acquired during atudies and after graduation offer them the possibility to engage themlesves into the healthcare system and to perform with superior performace the professional activities. However, their work could be more efficient if they upgrade their knowledge and skills. Thus, the Medical Faculty of the Military Medical Academy offers nine study programmes of the specialist academic studies of medicine. Specialist academic studies last one year totalling 60 ECTS credits. Those are: Traumatology (25 students), Medical Toxicology (10 students), Pharmacokinetics and Bioequivalence (5 students), Rational Pharmacotherapy (10 students), Implants in Oral Medicine (5 students), Oral Health and Parodontal Medicine (5 students), Bioengineering and Medical Informatics (5 students), Surgical–Orthodontics Facial and Jaw Treatment (5 students) and Oral Medicine (5 students).
The academic specialist study programme enables students to acquire additional knowledge and skills in certain branches of medicine, upon the completion MDs receive the title of specialist in an area.

Traumatology

Although trauma is seen as a sum of individual events, traumatic injuries have pandemic proportions and pose a challenge to all medical professionals. Management of the traumatized requires specific knowledge and skills that can only be mastered completely during a relevant specialization in the medical profession. However, general practitioners also take part in primary care of the traumatized, most often at the site, as well as during transportation. Academic specialist studies in Traumatology are geared towards them, to enable them to become actively involved not only in immediate management of the injured, but also in the planning of care in mass casualty accidents, and perform competent work in such situations. The curriculum involves 9 compulsory courses, through which students acquire knowledge and skills in management of complex injuries of the main organ systems. Students choose 3 out of 6 electives. Depending on the choice, students can acquire additional knowledge in the area of sports injury, transport of the injured, trauma infection, response of the injured to trauma, rehabilitation of the severely injured and epidemiology of the traumatic injuries.

TRAUMATOLOGY					
	COURSE	**S**	**SC**	**ECTS**	
1	Assessment of Injury Severity and Management Mechanism	I	✔	5	
2	Securing the Airway	I	✔	5	
3	Replenishment of Circulatory Volume	I	✔	5	
4	Posttraumatic Cardiac Arrest	I	✔	5	
5	Head & Neck Injuries	I	✔	5	
6	Injuries of Abdomen & Urogenital Tract	I	✔	5	
7	Chest and Large Blood Vessels Injuries	II	✔	4	
8	Bone & Joint Injuries	II	✔	3	
9	Thermal Injuries	II	✔	3	
10	Epidemiology of Trauma	II	( )	3	9
11	Transport of Severely Injured Patients	II	( )	3	
12	Infection in Trauma	II	( )	3	
13	Response of the Injured to Trauma	II	( )	3	
14	Sports Injuries of Locomotor System	II	( )	3	
15	Rehabilitation of Severely Injured	II	( )	3	
16	Specialist Paper	II	✔	11	
Total				**60**	

C – Semester CS –Course Status ✔ (Compulsory) ( ) (Electives)

Medical Toxicology

In case of acute poisoning, the main task of a doctor is to recognize the cause, to provide immediate aid and to prepare transport of the poisoned to the specialized institution for further management. Besides, within the healthcare system, doctors play an important role in the prevention of poisoning. Considering that the specialists in this area are lacking, upon completion of this academic specialization doctors will acquire academic knowledge and clinical skills for the management of the acutel poisoned. The curriculum of this study program has been designed to enable students to develop abilities for uniting previously acquired knowledge in the field of medicine and new specific knowledge in the field of medical toxicology. Through six compulsory courses and nine electives, out of which 3 are chosen, students gain knowledge and skills that will enable them to: recognize toxic and non-toxic expositions; set a differential diagnosis of acute poisoning; perceive a potential effect of chemical agents on the development and course of other diseases; choose and apply appropriate principles of pharmacology and toxicology in the management of the acutely poisoned; choose and interpret the relevant laboratory analyses when setting a diagnosis, perform forensic investigation and scientific research in this field; use poisonous substances database independently and take part in the work performed by the National Poison Control Center.

MEDICAL TOXICOLOGY					
	COURSE	**S**	**CS**	**ECTS**	
1	General Principles of Clinical Toxicology	I	✔	12	
2	Acute Pesticide Poisoning	I	✔	5	
3	Acute Gas Poisoning	I	✔	4	
4	Acute mushroom, plant and animal poisoning	I	✔	5	
5	Acute drug & opioid poisoning	II	✔	9	
6	Acute poisoning by household products & industrial poisons	II	✔	5	
7	Management of the acute poisoned in mass chemical accidents	I	( )	3	3
8	Accute occupational poisoning and their prevention	I	( )	3	
9	Antidotes	I	( )	3	
10	Role and activity of National Poison Control Center	II	( )	3	3
11	Special Aspects of Clinical Toxicology	II	( )	3	
12	Chemical Terrorism and Toxicology of Chemical Warfare Agents	II	( )	3	
13	Specialist Paper	II	✔	14	
Total				**60**	

S – Semester CS – Course Status ✔ (Compulsory) ( ) (Electives)

Pharmacokinetics and Drugs Bioequivalence

This study program is designed to develop competencies in the field of dynamic phenomena regulating the effect of drugs on the body as well as of external factors existing in the process of the development of drugs that can influence the behavior and effect of drugs. The curriculum consists of four compulsory courses and four electives, from which students choose two. After the specialization MDs and graduate pharmacists will be able to: understand the processes determining the effect of the drug after peroral intake: understand the external factors present in the process of curative substances' production which can change the effect of the drug on the organism: understand the use of methodology of quality and quantity determination of curative substances in biological material: understand the analyses of obtained pharmacokinetic data and basic approaches to interpreting calculated values of the most important pharmacokinetic parameters: understand the basic principles of comparative biological availability investigation of curative substances and the definition of their bioequivalence. In addition to all of this, the studies include the general introduction into basic legislative and principles of good laboratory practice related to work in analytical and clinical-pharmacological laboratory, as well as national legal regulations and international recommendations regulating this branch.

PHARMACOKINETICS AND DRUGS BIOEQUIVALENCE					
	Course	**S**	**CS**	**ECTS**	
1	Methodology of pharmacokinetic investigations	I	✔	10	
2	Statistical methods in pharmacokinetics	I	✔	5	
3	Instrumental methods in pharmacokinetics	I	✔	5	
4	Defense of clinical pharmacokinetics chapter	I+II	✔	20	
5	Generic and biosimilar drugs	II	( )	5	10
6	Validation of bioanalytical methods	II	( )	5	
7	Biopharmacy	II	( )	5	
8	Bioavailability of specific drug formulations	II	( )	5	
9	Specialist paper	II	✔	10	
Total				**60**	

S – Semester CS – Course Status ✔ (Compulsory) ( ) (Electives)

Implants in Oral Medicine

A modern approach to compensation of lost teeth or soft and hard tissues of the face and jaws can not be imagined without the use of implants today. Although implantology, as a subject, is studied within postgraduate studies at the integrated academic studies of dentistry, the professional improving knowledge requirements in this field are increasing. The Military Medical Academy can be proud of a continuous and organized use of the implant procedure for more than 30 years. In order to improve the knowledge of young dentists and providing critical appraisal of the possibilities of numerous implant system applications, an academic specialist study program lasting one year has been prepared. The curriculum consists of five compulsory courses including aspects of a patient selection, implant placement, and respect of aesthetic principles in the preparation of the implant and post-implantation diagnosis and treatment of complications. The special attention is given to orofacial deformities and the role of orthodontic and implants therapy in solving this complex issues. A student chooses two out of four electives which in their own way complement the current theoretical and practical achievements in the field of implant use in oral medicine.

IMPLANTS IN ORAL MEDICINE					
	Course	**S**	**CS**	**ECTS**	
1	Diagnostic procedures and plan of implant therapy	I	✔	5	
2	Surgical aspects of implant placement – orofacial region	I+II	✔	12	
3	Esthetics after dental implant surgery in orofacial region	I+II	✔	12	
4	Implant-orthodontic therapy for patients with orofacial deformities	I	✔	6	
5	Peri implant tissues and late post implant complications	I	✔	5	
6	Etiology and pathogenesis of orofacial region defects	II	↻	5	10
7	Basic immunological mechanisms in oral medicine	II	↻	5	
8	Reconstruction of dentoalveolar ridge deficit	II	↻	5	
9	Immunological reactions to bioimplants	II	↻	5	
10	Specialist paper	II	✔	10	
Total				**60**	

S – Semester CS – Course Status ✔ (Compulsory) ↻ (Electives)

Oral Health and Periodontal Medicine

The purpose of the specialist academic study program in oral health and periodontal medicine is the creation of competent professionals for the management of periodontal disease by multidisciplinary approach, as well as establishing the mutual relation between periodontal condition and the general health of the patient.
This one-year study program is realized through 6 compulsory and 4 elective (of which a candidate selects 2) courses. Students achieve the adequate scientific and professional knowledge in periodontal medicine. The aim of study program is to provide specific knowledge and skills and develop critical, integrated competence in the field of etiology, pathogenesis, planing the treatment of periodontitis, setting the proper indications and contraindications, selection of therapeutic procedures in the management of periodontal disease, as well as maintaining the achieved results.
By mastering the study program, students become able to critically evaluate the professional and scientific literature and to apply it in practice. After successful completion of the study program, students are entitled to rights stipulated by law.

ORAL HEALTH AND PERIODONTAL MEDICINE					
	Course	**S**	**CS**	**ECTS**	
1	Parodontopathy as multifactorial disease	I	✔	5	
2	New approaches to diagnosis, forecasts and parodontopathy therapy plan	I	✔	5	
3	Treatment of parodontopathy, surgical-conservative modern approach	I	✔	10	
4	Multidisciplinary approach in therapy of parodontopathy	I	✔	10	
5	Mucogingival anomalies, diagnostics and treatment mode	II	✔	10	
6	Use of medicaments in treatment of parodontopathy	II	( )	5	10
7	Pre-prosthetic preparation and prosthetic management of patients with parodontopathy	II	( )	5	
8	Orthodontic-periodontic principles of treatment	II	( )	5	
9	Basic immunologic mechanisms in oral medicine	II	( )	5	
10	Specialist paper	II	✔	10	
Total				**60**	

S – Semester CS – Course status ✔ (Compulsory) ( ) (Electives)

Bioengineering and Medical Informatics

The purpose of the study program of specialist academic studies in Bioengineering and Medical Informatics is the creation of competent professionals to work in medical institutions as well as institutions that are associated with the activities of medical institutions, primarily for the purpose of improving technical procedures in the process of diagnostics and treatment. It is achieved through one-year program of study, consisting of compulsory and elective courses. The adequate expertise in the field of Bioengineering and Medical Informatics is gained at the end of a study program. The study program is aimed at providing specific knowledge / skills and it develops critical, multidisciplinary, integrated competence and understanding of the technical and biological procedures used in diagnostics and therapy, which, along with the basics of physico-chemical processes in the human body can affect the improvement of health or the constructive solution of issues arising in the process of diagnostics and treatment. Having completed the study program, students are qualified for inclusion in the segments of professional work related to monitoring, maintenance and improvement of technical or biological procedures in the diagnostics and treatment of various diseases. Students are entitled to the rights stipulated by law finishing the academic specialist studies.

BIOENGINEERING AND MEDICAL INFORMATICS					
	Course	**S**	**CS**	**ECTS**	
1	Physics of human body and regulatory mechanisms	I	✔	5	
2	Introduction to telemedicine	I	✔	5	
3	Ionizing and nonionizing radiation and protection	I	✔	5	
4	Ethics in biomedical engeneering	I	✔	5	
5	Physiological signal processing	II	↻	6	30
6	Computer networking	II	↻	5	
7	Processing methods of medical image in diagnostic radiology	II	↻	5	
8	Visuelization techniques in nuclear medicine	II	↻	5	
9	Use of laser in therapy	II	↻	6	
10	Methods in radiotherapy	II	↻	6	
11	Noninvasive brain stimulation	II	↻	4	
12	Biomaterials and biocompatibility	II	↻	5	
13	Stem cells in therapy	II	↻	5	
14	Cell biology and immunology for engineers	II	↻	5	
15	Techniques in molecular biology and gene expression application	II	↻	6	
16	Specialist paper	II	✔	10	
Total				**60**	

S – Semester CS – Course Status ✔ (Compulsory) ↻ (Electives)

Surgical-orthodontic treatment of facial and jaw deformities

The purpose of the study program of specialist academic studies in surgical-orthodontic treatment of facial and jaw deformities at the Medical Faculty of the Military Medical Academy was the creation of high-quality and competent experts who could solve complex medical and dental problems of orofacial region mastering various diagnostic and therapeutic methods in the field of the entire oral medicine. Management of patients with different types of orofacial region's issues, different orthodontic malocclusions of different ages, congenital and acquired deformities of the face and jaws, patients with complex problems as pathological tooth migration caused by advanced periodontal disease or partial toothlesness and applying the latest modalities of orofacial orthodontic and orthopedic therapy in interdisciplinary cooperation will contribute to improving the quality of both oral as well as health of the population in general. The structure of the one-year study

program ensures that through the content of compulsory and elective courses, students acquire the adequate professional and scientific knowledge in the application of orthodontic apparatus in oral medicine.

The study program pays a special attention to providing specific knowledge about orthodontic surgical treatment of congenital and acquired facial and jaw deformities, their diagnostics, treatment planning, teamwork implementation of the therapy and surgical procedures in this regard.

SURGICAL-ORTHODONTIC TREATMENT OF FACIAL AND JAW DEFORMITIES					
	COURSE	**S**	**CS**	**ECTS**	
1	Growth and development of craniofacial system	I	✔	5	
2	Diagnostics and planning of surgical-orthodontic treatment of facial and jaw deformities	I	✔	5	
3	Orthodontic-surgical treatment of patients with congenital and acquired dento-facial deformities	I	✔	10	
4	Orthodontic therapy with fixed apparatuses	I	✔	10	
5	Interdisciplinary treatment of maxillo-facial system's disorder in adult patients	II	✔	10	
6	Orthodontic therapy in preadolescents	II	( )	5	10
7	Orthodontic implant treatment of patients	II	( )	5	
8	Biomechanics of tooth movement	II	( )	5	
9	Diagnostics and treatment of temporomandibular dysfunction	II	( )	5	
10	Specialist paper	II	✔	10	
Total				**60**	

S – Semester CS – Course Status ✔ (Compulsory) ( ) (Electives)

Oral Medicine

The aim of this study program is to create experts competent of oral diseases management by multidisciplinary approach as well as establishing mutual relation of oral diseases and general health of patients.

This is realized through one year program with a structure of compulsory and elective courses and students have an opportunity to acquire scientific and professional knowledge in oral medicine.

Study program is designed to provide specific knowledge and skills, to develop critical, integrated competancies in the field of etiology, pathogenesis, diagnosis and therapy planning for oral diseases, setting adequate indications and contraindications, selection of therapeutic procedures in the management of oral diseases as well as sustainability of achieved results.
Upon completion of studies, students will be competent to participate in the management of the mucous membrane of the oral cavity diseases, and, in cooperation with specialists from other dental and medical fields provide adequate therapy.

ORAL MEDICINE					
	Course	**S**	**CS**	**ECTS**	
1	Introduction to oral medicine and oral pathology	I	✔	5	
2	Etiological, diagnostic and therapeutic aspects of oral cavity infections	I	✔	5	
3	Oral manifestations of systemic diseases	I	✔	10	
4	Multidisciplinary approach in diagnosis and therapy of orofacial pain	I	✔	10	
5	Prinicples of therapy in oral medicine	II	✔	10	
6	Work principles with gerontologic patients in dental practice	II	( )	5	10
7	Emergency cases and their therapy in dentistry	II	( )	5	
8	Salivary glands diseases	II	( )	5	
9	Dental photography	II	( )	5	
10	Specialist paper	II	✔	10	
Total				**60**	

S – Semester CS – Course Status ✔ (Complusory) ( ) (Electives)

PhD Studies

The MMA Medical Faculty offers academic doctoral studies (PhD) in medicine in duration of 3 years. One study program – Biomedicine is accredited with five modules: Neurosciences, Molecular Medicine, Pharmacology and toxicology, Clinical Medicine and Preventive Medicine. This study program is worth 180 ECTS credits and it is accredited for 20 students.

The first generation of students, civilians, were enrolled in the school year 2012/2013. Study PhD program of Biomedicine offers common academic courses in the first year of studies that give them the knowledge and skills to embark with ethical and methodological competence in research of scientific fields encompassed by modules.

Students graduated from the Medical Faculty i.e. Pharmaceutical, Faculty of Dentistry, Veterinary or Biology etc. can enroll in the first year having gained 300 ECTS credits in undergraduate academic studies, or 360 ECTS credits gained in integrated graduate medical studies. Students enroll in the second year having passed all the exams from the first year and acquired 60 ECTS credits, and the third year students enroll after having passed exam courses of the selected module and who acquired the additional 60 ECTS credits.

Having chosen a certain scientific field within the elective module students in agreement with a mentor propose a research topic and present the outline for their doctoral dissertation which is realized during the third year of PhD studies. Students present research results to the academic community through published papers and their presentation in scientific conferences. Students

after having published the research results in the scope that is regulated by the Rule Book defend in public the doctoral dissertation and obtain the academic degree – PhD.

The elaboration and defense of doctoral dissertation will enable the prospective doctors a competent application of modern methods and knowledge in biomedical scientific research.

FIRST YEAR				
	Course	**S**	**CS**	**ECTS**
1	Scientific-research methodology	I	✔	10
2	Biomedical statistics	I	✔	10
3	Biomedical scientific informatics	I	✔	10
4	Ethics in biomedicine	II	✔	10
5	Experimental models in biomedicine	II	✔	10
6	Homeostasis and regulatory mechanisms	II	✔	10
Total				**60**

S – Semester CS – Course Status ✔ (Complusory) ↻ (Electives)

SECOND YEAR MODULE II – PHARMACOLOGY AND TOXICOLOGY				
	Course	**S**	**CS**	**ECTS**
1	Molecular mechanisms of drug and poison action	III	✔ *	15
2	Methodology of preclinical and clinical drug investigation	III	✔ *	15
3	Pharmacokinetics	IV	↻ *	15

4	Pharmacoepidemiology and pharmacoeconomy	IV	( )*	15	30
5	Pharmacovigilance	IV	( )*	15	
6	Pharmaco-toxicological aspects of organism's reaction to stress	IV	( )*	15	
7	Pathophysiological,diagnostic and therapeutic aspects of acute poisonings	IV	( )*	15	
Total				**60**	

S – Semester CS – Course Status ✔ (Complusory) ( ) (Elective Module)

SECOND YEAR **MODULE I –MOLECULAR MEDICINE**					
	Course	**S**	**CS**	**ECTS**	
1	Human Molecular Genetics	III	✔*	10	
2	Basics of Immunology	III	✔*	10	
3	Regulation of biochemical processes	III	✔*	10	
4	Molecular Oncology	IV	( )*	15	30
5	Epigenetics	IV	( )*	15	
6	Cell and tissue bioengineering in transplant and regenerative medicine	IV	( )*	15	
7	Immune regulatory mechanisms in health and disease	IV	( )*	15	
8	Basics of Immunopathology	IV	( )*	15	
9	Molecular Microbiology	IV	( )*	15	
10	Homeostasis and Thrombosis	IV	( )*	15	
11	Biomarkers of Metabolism	IV	( )*	15	
12	Cytogenetics and Molecular Pathology	IV	( )*	15	
Total				**60**	

S – Semester CS – Course status ✔*(Compulsory for Module) ( )*(Electives)

SECOND YEAR **MODULE III – NEUROSCIENCE**					
	Course	**S**	**CS**	**ECTS**	
1	Basics of Neuroscience	III	✔*	15	
2	Functional Neuroanatomy	III	✔*	15	
3	Noninvasive brain stimulation methods	IV	( )*	15	30
4	Analysis of biological signals coming from nerve generator	IV	( )*	15	
5	Nervous system developemt	IV	( )*	15	
6	Molecular mechanisms in neurological diseases	IV	( )*	15	
Total				**60**	

S – Semester CS – Course Status ✔*(Compulsory) ( )*(Electives)

SECOND YEAR MODULE V- PREVENTIVE MEDICINE					
	Course	**S**	**CS**	**ECTS**	
1	Investigation principles in preventive medicine	III	✔ *	9	
2	Prevention of chronic non-infectious diseases	III	✔ *	7	
3	Diagnostics and prevention of infectious diseases	III	✔ *	7	
4	Environment and work environment harfmful effects	III	✔ *	7	
5	Medical ecology and life quality	IV	( ) *	15	30
6	Ergonomics and physiology of effort	IV	( ) *	15	
7	Medical nutrition therapy	IV	( ) *	15	
8	Radiation protection	IV	( ) *	15	
9	Recurrent and new infectious diseases epidemiology	IV	( ) *	15	
10	Molecular mechanisms of antimicrobial resistance	IV	( ) *	15	
11	Microbes and oncogenesis	IV	( ) *	15	
12	Medical geography	IV	( ) *		
Total				**60**	

S – Semester CS – Course Status: ✔ * (Compulsory) ( ) * (Electives)

SECOND YEAR MODULE IV– CLINICAL MEDICINE					
	Course	**S**	**CS**	**ECTS**	
1	Internal medicine chapter defense	III	( ) *	30	30
2	Surgery chapter defense	III	( ) *	30	
3	Neurology and Psychiatry chapter defense	III	( ) *	30	
4	Diagnostic disciplines chapter defense	III	( ) *	30	
5	Cardiology chapter defense	IV	( ) *	15	30
6	Pulmonology chapter defense	IV	( ) *	15	
7	Gastroenterology chapter defense	IV	( ) *	15	
8	Endocrinology chapter defense	IV	( ) *	15	
9	Nephrology chapter defense	IV	( ) *	15	
10	Dermatology chapter defense	IV	( ) *	15	
11	Infectious diseases chapter defense	IV	( ) *	15	
12	Rheumatology chapter defense	IV	( ) *	15	
13	Hematology chapter defense	IV	( ) *	15	
14	Transfusiology and regenerative medicine chapters defense	IV	( ) *	15	
15	Neurology chapter defense	IV	( ) *	15	
16	Psychiatry chapter defense	IV	( ) *	15	
17	Orthopedics and traumatology chapter defense	IV	( ) *	15	
18	Neurosurgery chapter defense	IV	( ) *	15	
19	Ophthalmology chapter defense	IV	( ) *	15	
20	Otorhinolaryngology chapter defense	IV	( ) *	15	
21	Maxillofacial surgery chapter defense	IV	( ) *	15	
22	Chest surgery chapter defense	IV	( ) *	15	
23	Cardiosurgery chapter defense	IV	( ) *	15	
24	Abdominal surgery chapter defense	IV	( ) *	15	

25	Vascular surgery chapter defense	IV	( )*	15	
26	Urology chapter defense	IV	( )*	15	
27	Plastic surgery chapter defense	IV	( )*	15	
28	Physical medicine and rehabilitation chapter defense	IV	( )*	15	
29	Radiology and radiotherapy chapter defense	IV	( )*	15	
30	Nuclear medicine chapter defense	IV	( )*	15	
31	Clinical biochemistry chapter defense	IV	( )*	15	
32	Oncology chapter defense	IV	( )*	15	
33	Pathology chapter defense	IV	( )*	15	
34	Forensic medicine chapter defense	IV	( )*	15	
Total				**60**	

S – Semester CS – Course Status: ✔* (Mandatory) ( )* (Electives)

THIRD YEAR				
	Course	**S**	**CS**	**ECTS**
1	Elaboration of doctoral thesis	V	✔	30
2	Defense of doctoral thesis	VI	✔	30
Total				**60**

S – Semester CS – Course Status: ✔* (Mandatory) ( )* (Electives)