GENERAL INFORMATION

Course name	**Internal Medicine 6 - Cardiology**
Course director	**Prof. Jure Mirat, MD, PhD**
Assistants	Prof. Kristina Selthofer-Relatić, MD, PhD
Study program	**Integrated undergraduate and graduate university study program Medical Studies in German**
Course status	Mandatory
Year of study, semester	3rd year, 6th semester

Credits allocated and form of instruction	ECTS student workload	**5**
	Number of teaching hours (L+S+E)	**65** (25+15+25)

COURSE DESCRIPTION

Course objectives

Learn symptoms, diseases and syndromes of cardiovascular system, their incidence, causes, diagnostic algorithms, prognosis, prevention and treatment.

Course requirements

There are no specific requirements for this course except those defined in the study program curriculum.

Learning outcomes relevant to the study program

1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2

Expected learning outcomes *(5-10 learning outcomes)*

Knowledge

1. Classify, define, describe and distinguish between specific cardiovascular diseases as unique clinical entities;
2. Describe leading symptoms and signs of diseases of the cardiovascular system and connect them to specific clinical pictures and syndromes and interpret the basic pathophysiological mechanisms of the development of the most important clinical entities;
3. Present differential-diagnostic possibilities based on clinical symptoms and signs patients have;
4. Plan and select the proper diagnostic procedures in certain conditions, syndromes and diseases of the cardiovascular system and critically evaluate the results of diagnostic tests;
5. Connect and integrate the knowledge from the clinical picture and the diagnostic procedure and critically evaluate the correct diagnosis of diseases of the cardiovascular system;
6. Identify the basic principles of treatment and map out the most appropriate type and sequence of therapeutic interventions;
7. Critically evaluate various invasive and non-invasive treatment methods of specific diseases and provide arguments to the patient;
8. Predict the appropriate prognosis of a disease and analyze the course, effects and outcomes of medical treatment;
9. Recognize diagnostic and treatment methods in accordance with the principles of "evidence-based medicine"

Skills

1. Demonstrate the ability to independently take a medical history, perform a clinical examination of the cardiovascular system and determine a working diagnosis;
2. Identify the leading symptoms of cardiovascular diseases and identify the correlation between these symptoms and specific clinical entities;
3. Recognize the symptoms of a life-threatening condition in a patient and present how to provide care for them;
4. Become proficient in discussing the clinical picture and interpreting the differential diagnosis;
5. Become proficient in interpreting and discussing the patients' diagnostic findings;
6. Carry out certain clinical skills independently in accordance with the Clinical Skills Handbook;
7. Under supervision, complete different diagnostic and therapeutic procedures as outlined in the Clinical Skills Handbook;
8. Demonstrate the means for managing diagnostic and therapeutic procedures and monitoring patients in accordance with appropriate procedures (algorithms);
9. Keep patients' medical records;
10. Participate in team, interdisciplinary and multidisciplinary clinical work and demonstrate good communication skills with the patients, their companions and staff.

Course content

Ischemic heart disease, Acute coronary syndrome (etiology and risk factors for ischemic heart disease, angina pectoris, acute coronary syndrome, heart rhythm and conduction disorders, decompensated heart failure, sudden death, non-ST-elevation and ST-elevation acute coronary syndrome, myocardial infarction). Leading cardiac symptoms and main examination methods in cardiology, Clinical detection and therapeutic approach to acute coronary syndrome (electrocardiogram, continuous ECG, electrophysiological study, radiology, polycardiography, echocardiography and Doppler, nuclear cardiology, invasive diagnostic and interventional methods in cardiology, angiogram, dyspnea, Cheyne-Stokes respiration, nocturia, oliguria, cerebral symptoms, problem-solving). Heart failure treatment, Heart transplantation (general treatment procedures, specific treatment, dosage, digitalis toxicity treatment, contraindications, cardiac failure management strategy, indications for heart transplant, recipient and donor selection, operational technique, immunosuppression and rejection, other complications of heart transplant, transplanted heart function). ECG: recording basics, normal ECG, ECG: Coronary disease, pericarditis (structure of a specific cardiac conduction system, apparatus, variants of normal electrocardiogram, influence of electrolytes and drugs on electrocardiogram, pseudoinfarctions in electrocardiogram, acute pericarditis syndrome, pericardial decompression syndrome, special forms of pericarditis, problem-solving). Pulmonary embolism, Cardiac shock, Reanimation (massive pulmonary embolism, submassive pulmonary embolism, pulmonary infarction, chronic pulmonary hypertension, general measures in cardiogenic shock, oxygenation, circulating volume, vasoactive drugs, ABCDE approach in resuscitation, basic principles of resuscitation). Cardiac emergencies, Emergency interventions and resuscitation (recognition and timely response to cardiac emergencies, myocardial infarction, emergency procedures and drugs used in emergencies, patient and resuscitation approach algorithms, problem-solving). Myocarditis and cardiomyopathies, Endocarditis (infectious, immune and toxic myocarditis, diagnostic procedures and treatment, dilatated, hypertrophic and restrictive cardiomyopathy, acute bacterial endocarditis, subacute bacterial endocarditis, non-infective endocarditis). Early coronary disease detection, ECG: hypertrophy, blocks, electrolyte disturbances (coronary disease prevention, risk factors for coronary disease development, early detection of coronary disease symptoms, ventricular hypertrophy, cardiac conduction muscle blocks - 1st, 2nd and 3th grade (sinoatrial blocks and atrioventricular blocks, imbalance of potassium, calcium and other electrolytes, problem-solving). Valve diseases and congenital heart defects (mitral stenosis, mitral insufficiency, mitral valve prolapse, aortic stenosis and insufficiency, tricuspid stenosis and insufficiency, pulmonary stenosis and insufficiency, atrial septal defect, ventricular septal defect, patent ductus arteriosus, Eisenmenger syndrome, pulmonary

stenosis, coarctation of the aorta, Tetralogy of Fallot, Ebstein's anomaly, abnormal outlet of large coronary arteries, abnormal cardiac position). Physical diagnosis of the most common acquired and congenital heart defects (diagnosis of physical parameters, routine medical history taking, physical examination, ECG, RTG, echocardiography, cardiac catheterization and angiocardiography, problem-solving).

Peripheral artery and venous diseases (intermittent claudication, acute arterial occlusion, functional peripheral artery disease, varicose veins, thrombophlebitis, phlebothrombosis, chronic venous insufficiency). Approach to patient with angiologic disease, Diagnosis and treatment of peripheral artery and venous diseases (lab tests, electrocardiogram, chest X-ray, Doppler echocardiography, ergometric testing, history-taking and physical findings, palpation and auscultation, troubleshooting of problem cases). Treatment of heart rhythm disorders (drug treatment of arrhythmias, RF catheter ablation, cardiac pacing, implantable cardioverter-defibrillator).

ECG: tachycardia and bradycardia rhythm disorders, pre-excitation (proper rhythm disorders detection, diagnosis and treatment, problem-solving). Echocardiography, Sudden death (one-dimensional visualization, two-dimensional visualization, Doppler echocardiography, processing causes of sudden death: arrhythmias, coronary disease, respiratory and lung tissue disease, central nervous system disease, metabolic reasons, problem-solving), Pacing, Clinical ECG symptoms (treatment of tachyarrhythmias and heart failure, working principle of pacemaker, methods of pacemaker implantation, pacemaker management, problem-solving). Arterial hypertension, diagnosis and treatment (etiology of arterial hypertension, stage I, II and III, causes, correct diagnosis, natural course of disease, systemic organ damage caused by arterial hypertension, patient education, lifestyle change, drug treatment, problem-solving). Coronary disease in women, Symptoms, diagnosis and treatment of myocardial infarction (differences in manifestation and course of disease between men and women, chest pain, electrocardiographic changes, increase in serum enzyme activity, non-specific hematological changes caused by necrosis and inflammation, emergency treatment, early treatment and treatment of late complications, problem-solving). Medical rehabilitation of cardiovascular patients (assessment of the degree of residual function, limited working capacity or complete loss of working capacity, psychological aspects). Risk factors for heart and blood vessel disease, Preventive cardiology (overweight, lack of physical activity, excessive intake of salt and alcohol, smoking, investment in prevention, problem-solving).

Form of instruction	☒lectures ☒seminars and workshops ☒exercises ☐distance learning ☐field course	☐individual assignments ☐multimedia and internet ☐laboratory ☐mentoring activities ☐other

Student obligations

Come to class prepared by studying the recommended literature for each unit and actively participate in all forms of instruction. The student must participate in at least 70% of classes to pass the course.

Monitoring student learning

Attendance	x	Active participation	x	Seminar paper		Experimental work	
Written exam	x	Oral exam	x	Essay		Research	
Project		Continuous assessment		Paper		Practical work	
Portfolio							

Assessment and evaluation of students during class and on the final exam

Students' performance will be evaluated during class and on the final exam. Students are evaluated numerically and descriptively (insufficient (1), sufficient (2), good (3), very good (4), excellent (5)). During classes, a student can earn a maximum of 100 points. Students can earn a maximum of 20 points during classes through different types of activities. On the final exam,

students can earn a maximum of 80 points. The final grade represents the sum of the points earned during classes and on the final exam.

Mandatory reading

1. Basislehrbuch Innere Medizin. Kompakt, greifbar, verständlich. Braun J, Renz-Polster H; Urban & Fischer, Mchn: 2000

Additional reading

The number of copies of mandatory reading in proportion to the number of students currently taking this course

Title	Number of copies	Number of students
Basislehrbuch Innere Medizin. Kompakt, greifbar, verständlich. Braun J, Renz-Polster H; Urban & Fischer, Mchn: 2000	20	60

Quality monitoring methods ensuring the acquisition of knowledge upon completion, skills and competences

The quality of course performance is monitored through an anonymous student survey on the quality of the organization and conduction of classes, the course content and the work of professors. The usefulness of the lectures from the students' perspective, the curriculum content, the professor preparedness, the clarity of the presentation, the amount of new content and the quality of the presentation are evaluated. The curriculum and its execution are administratively compared. The participation of students in lectures and exercises, as well as the excuses for missing classes, are controlled and analyzed.