

**Approved at Department Council №4 on 07.07.2020 r.**

**ACADEMIC STANDARD IN CARDIOLOGY  
CHARACTERISTICS OF THE DISCIPLINE**

**1. Goal of the discipline training**

The purpose of the training is to prepare doctors who can examine, diagnose and treat patients with cardiovascular diseases. Doctors, regardless of which area they work in, always face cardiovascular diseases, due to their great significance and prevalence. Students are required to study the most important nosological units in cardiology – myocardial infarction, angina pectoris, myocarditis, cardiomyopathies, arterial hypertension, etc. The aim of the training is to help students acquire clinical thinking and be able to build a logical differential-diagnostic plan. For this purpose, curricula have been prepared, which are developed in accordance with the objectives of the Master's degree and with the generally accepted university procedures.

**2. Learning content of the discipline**

The priority objectives of cardiology training include the development of the students' personal qualities, the promotion of their initiative, the creation of habits of permanent self-education and the ability to learn on their own, the acquisition of "transferable" knowledge, key competencies, and skills. This is reflected in the syllabus of the discipline.

The students have a total of 30 academic hours of cardiology lectures in the course of one semester. Practical lessons amount to 75 academic hours in the course of one semester.

**Lectures:**

1. Chronic heart failure – classification, hemodynamics, treatment – 2h
2. Acute heart failure – 1h. Cardiogenic shock – 1h.
3. Rhythm and conduction disturbances – 2h.
4. Pulmonary thromboembolism – 1h. Chronic cor pulmonale – 1h.
5. Rheumatic heart disease – 1h. Infective endocarditis – 1h.
6. Mitral valve disease – 2h.
7. Aortic valve disease – 2h.
8. CAD – classification, etiology, risk factors – 1h. Antiischaemic drugs – 1h.
9. Stable angina – 1h. Unstable angina – 1h.
10. Acute myocardial infarction – etiology, pathogenesis, risk factors, clinical characteristics – 2h.
11. Acute myocardial infarction – complications, differential diagnosis, treatment – 2h.

12. Arterial hypertension – 2h.
13. Diseases of the myocardium - myocarditis - 1h. Cardiomyopathies - 1h.
14. Diseases of the pericardium - 1h. Congenital valvular disease – 1h.
15. Atherosclerosis – primary and secondary prevention – 2h.

**Practical lessons:**

1. Methods for cardiac investigation
2. Chronic Heart Failure – hemodynamics, classification, clinical characteristics
3. Chronic Heart Failure – treatment
4. Acute HF – cardiac asthma, acute pulmonary edema, cardiogenic shock
5. Arrhythmias – supraventricular
6. Arrhythmias – ventricular
7. Conduction disturbances
8. Treatment of arrhythmias
9. Colloquium – HF, arrhythmias
10. Chronic cor pulmonale
11. Rheumatic heart disease
12. Infective endocarditis
13. Mitral stenosis
14. Mitral regurgitation
15. Aortic stenosis
16. Aortic regurgitation
17. Colloquium – valvular heart diseases.
18. CAD – classification, etiology, risk factors
19. Antiischemic drugs
20. Stable angina
21. Unstable angina
22. Myocardial infarction – pathogenesis, clinical manifestation, diagnosis
23. Myocardial infarction – complications, differential diagnosis
24. Treatment
25. Colloquium – CAD
26. Arterial hypertension – etiology, pathogenesis, clinical manifestation
27. Arterial hypertension – treatment
28. Diseases of the myocardium. Myocarditis
29. Cardiomyopathies

### 30. Pericardial diseases

#### 3. Requirements

In order to properly master the course in cardiology there are several requirements:

- To know about the anatomy, physiology, and pathophysiology of the cardiovascular system
- To have mastered the course in Propedeutics of Internal diseases

Upon completion of the course of training in Cardiology, students should be able to take an anamnesis, conduct a physical examination of the patient, build a preliminary diagnosis and make a therapeutic plan.

#### 4. Academic resources

The Department of Cardiology consists of four professors, eight assistant professors, and two hired assistants. The lecture course and the cardiology training in Bulgarian and English are conducted by them. Three of the habilitated professors are specialists in both Internal Medicine and Cardiology, and so are a great portion of the assistant professors. The scientific production of the academic staff is in several directions – arterial hypertension, heart failure, dyslipidemia.

#### Material resources

The Clinic of Cardiology has all the necessary equipment for non-invasive and invasive diagnostics in Cardiology – electrocardiographs, echocardiographs, 24-hour Holter ECG, Veloergometer, Treadmill, Angiograph, Electrophysiological study. Coronary computed angiography is also available as a result of the collaboration with the Imaging Department.

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**Practical lessons:**

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Students have the practical lessons at the Clinic of Cardiology twice a week – one three-hour long and one two-hour long lesson. Under the guidance of the assistant next to the patient's bedside, a physical examination is carried out, the relevant clinical syndromes are discussed and the clinical diagnosis is built. Based on the latter, therapeutic behavior is commented on. When students make enough progress, they are left to independently examine the patient and subsequently report their findings to the assistant and the group. Thus, discussions about the diagnosis, differential diagnosis and treatment plan (drugs and doses) is held. Students are taught how to do an electrocardiogram during training. Echocardiographies of the patients are discussed.

### **5. Seminars**

Seminars are mandatory for 6<sup>th</sup> year students and are held according to a program. Each topic is presented by a certain assistant. A schedule of these seminars is available during the 6<sup>th</sup> year practice.

### **6. Information sources**

The main academic source for the training in Cardiology is the textbook “Cardiology” 2015, edited by prof. Tokmakova. It is required that students have an electrocardiography manual (regardless of the publisher), preferably a pocket-size format, so that they can use during the practical lessons.

### **7. Colloquiums**

Colloquiums are conducted by the assistants after completion of each thematic section. The results of the tests are discussed in order to fill in the gaps of knowledge. The results of the colloquiums are included as a component of the final evaluation for the semester.

### **8. Self-study and student engagement**

During the practical lessons, each student is allowed to independently examine the patient for 10-15 minutes in order to make a preliminary diagnosis and suggest treatment. Each student then presents the case to the entire group. This is an excellent way to revise the studied material and for the assistant to assess the students' knowledge.

The assistant guides the students in choosing any additional literary sources. Students are provided with electrocardiogram collections of the Clinic of Cardiology compiled over the years. At each practical lesson the students are encouraged into reading electrocardiograms of either hospitalized patients or from the collections.

### **9. Cooperation between the students and the teaching team**

Assistant professors are engaged from the very first practical lesson, when a brief review of the anatomy, physiology and pathophysiology of the cardiovascular system is made. Each

practical lesson should have time allocated for questions and answers. Every student who has a special interest in cardiology is given the opportunity to visit the weekly main visiting rounds at the clinic, where discussions of interesting clinical cases occur.

Students are always invited to attend pathoanatomic meetings, which are the best verification of the clinical diagnosis. The Medical University - Plovdiv also has a Simulation Center, which allows for the conduction of some of the practical lessons in it in order to better exercise on heart sounds and murmurs, electrocardiographic monitoring and basic echocardiography. Distinguished students are also invited to join scientific projects, the results of which they may present at university forums.

### **10. Exams**

The current grades according to the curriculum of the specialty are given for:

Each assistant exercises ongoing control of students' knowledge during the practical lessons with the presentation of cases by the students themselves, which is very good feedback. At the end of each thematic section, the students sit a colloquium, and after that, the mistakes are commented on in order to fill in the gaps in knowledge.

### **11. Assessment standards:**

Standards for assessing a student's achievements should be carefully considered and defined in such a way as to objectify the grades of students which should not be subjectively decided by the assistant.

**Excellent (6)** – for excellent presentation of clinical thinking on cardiovascular pathology, thoroughly mastered diagnostic and differential diagnostic algorithms, skills for solving complex diagnostic cases, independent thinking, and reasoning of solutions.

**Very good (5)** – for very well mastered basic and additional knowledge of cardiovascular pathology, meaningful and correct understanding of the studied material, and skills for applying what has been learned in complex cases.

• **Good (4)** – for mastered key and additional knowledge for solving cases and tasks, but without being able to implement them on their own;

• **Fair (3)** – for acquired basic knowledge on cardiovascular nosological units and for solutions to simple tasks.

• **Poor (2)** – none of the aforementioned requirements are met.

### **12. Formation of the final grade:**

The final grade reflects to what extent the student has achieved the objectives of the training, set at the beginning. It is multicomponent and includes a written final exam assessment and at least one of the following:

1. Grades from the ongoing assessment(s);
2. Grade from a practical final examination;

Possible other components are: – the grades of ongoing evaluations with colloquiums;

The academic standard for a scientific discipline is confirmed by a Decision of the Academic Council – Protocol No.; y, and is published on the website of the Medical University - Plovdiv