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MEDICAL UNIVERSITY - PLOVDIV  
FACULTY OF PHARMACY  
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

ACADEMIC STANDARD  
OF  
CLINICAL IMMUNOLOGY  
FOR  
MEDICAL STUDENTS

MEDICAL UNIVERSITY - PLOVDIV  
FACULTY OF PHARMACY  
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

### 1. Purpose of the course in Clinical Immunology

The main objective of the clinical immunology course is to study, diagnose and treat patients with diseases of the immune system or disease processes resulting from changes in the immune mechanisms; the implementation in medical practice of the latest developments in immunology, as well as immunological manipulations, which are an important part of the therapy or prevention of a disease.

The objective is concordant with:

- the volume and credit rating of the discipline (ECTS system), evident from the syllabus available on the website of MU - Plovdiv;
- the qualification characteristic of the specialty;
- Educational degree (Master's).

The aim is compliant with the place of the discipline "Clinical immunology" in the specialty "Medicine" in its importance and in chronology with the curriculum. As an interdisciplinary subject, it serves the next stages of medical training.

**Priority goals of the University are:** Development of students' personal qualities, encouragement of their initiative, creation of habits for permanent self-education and ability to learn on their own, acquisition of "transferable" knowledge, key competences and skills. This is also reflected in the content of the course in Clinical Immunology.

### 2. Course content in the field of Clinical Immunology

The topics and classes of clinical immunology lectures and practicals are listed on the website of MU - Plovdiv: <https://mu-plovdiv.bg/en/faculties/faculty-of-pharmacy/departments/departments-of-microbiology-and-immunology/> and in Appendix 1. The content is arranged chronologically so that each subsequent lecture and related practicals use already learned matter and concepts. The unnecessary overlap or the existence of "white spots" between "curriculum-related" disciplines is avoided.

The main objectives of the Clinical Immunology curriculum are:

1. Presentation of information on immune-mediated diseases such as immune deficiencies, allergies, autoimmune diseases, tumor diseases, transplants, reproductive failures.
2. Providing students with knowledge of the study of the human immune system in health and in disease by applying specific immunological methods and their interpretation.
3. Determination of indications for immunomodulatory therapy, drug monitoring, monitoring of the activity of the disease process affecting the immune system.
4. Gaining experience in experimental immunology.

### **3. Preconditions**

The medical student must have basic knowledge of biology and chemistry from the educational programs in the first year of the Medical University, microbiology and medical genetics (second and third year), clinical laboratory (fourth year), propedeutics of internal and surgical diseases (third year) to begin and successfully complete Clinical Immunology training.

### **4. Academic resources**

The academic staff of the Department of Microbiology and Immunology includes 4 habilitated lecturers under a basic employment contract (one of whom is a Professor of immunology), 1 non-habilitated lecturer with an educational and scientific degree (PhD) "doctor" in the relevant scientific specialty "Immunology", 1 non-habilitated lecturer with an educational and scientific degree (PhD) "doctor" in microbiology and 7 other non-habilitated professors. Of all professors, 2 have acquired a specialty in Immunology (1 habilitated and 1 non-habilitated), 7 have a specialty in Microbiology, and 1 - in Virology. Two lecturers are enrolled and provide training in the field of Clinical Immunology and the other two are in Microbiology. Two of the habilitated professors also have a second Master's Degree in Health Management.

The lectures are delivered by a habilitated professor with an educational and scientific degree (PhD) "doctor" under the relevant doctoral program. Practical classes are conducted by non-habilitated professors (assistant, chief assistant). All non-habilitated professors hold a Master's Degree in Medicine and are appointed after a competition.

### **5. Material resources**

The Department of Microbiology and Immunology of MU-Plovdiv has 4 study laboratories, equipped with microscopes with specialized observation software, multimedia presentation equipment and an interactive training system for students to illustrate the learning process. The total (laboratory) area of the department is 470.27m<sup>2</sup>. From it the laboratory premises have an area of 141m<sup>2</sup>. In the department there is also a museum selection with a collection of laboratory equipment and microscopes to assist with the study work as demonstration materials. The laboratory equipment of the department includes general equipment (laboratory scales, refrigerators, freezers, incl. low temperature at -80°C, standard incubators, CO<sub>2</sub> incubator, water baths, centrifuges, incl. high-speed, etc.) and specialized diagnostic equipment (flow cytometer, cell sorter, turbidimeter, nephelometer, immunofluorescent and inverted microscopes, real-time PCR, multiplexed PCR for specialized diagnostics, automated ELISA systems, incl. bacterial growth analyzer in body fluids, automatic fluorimeter to determine viral markers).

### **6. Lecture training**

The lectures are prepared and delivered in the form of multimedia presentations, which are provided to students in electronic form, incl. on the website of MU - Plovdiv so that they can prepare for each class. The volume and format of the lectures are the choice of the lead lecturer.

### **7. Practical classes**

They are conducted in groups. Methodological instructions, manuals and MCQ are provided for the practicals. With MCQ is checked:

- student training;
- the results (knowledge and skills gained) of the specific practical. There is also a discussion with the students on each practical class.

## **8. Information resources. Literature. Websites.**

The assistant professor is obliged to develop lectures and practicals in the discipline and to provide his lectures, training MCQ and other study materials in electronic form.

A list of the main recommended literature for the discipline "Clinical Immunology" for each component (lectures, practicals) with priority of the available sources (main literature) is presented. Internet resources may also be recommended to find suitable materials for student preparation.

### **Textbooks for medical students in Clinical Immunology - English training**

#### **Obligatory:**

1. Clinical Immunology: Principles and Practice, 4e. Robert Rich, Thomas A Fleisher, William T. Shearer, Harry Schroeder, Anthony J. Frew, Cornelia Weyand. Elsevier Saunders, 2013, ISBN-13: 978-0723436911, 1235 pp. **or**
2. Immunology for medical students- 2nd ed. Roderick Nairn, Matthew Helbert, 2006, eBook ISBN: 9780702058479, 320pp.
3. Essentials of Clinical Immunology, Helen Chapel, Mansel Haeney, Siraj Misbah, Neil Snowden, 6th Edition, Wiley-Blackwell, 2014, ISBN : 978-1-118-47295-8, 376pp.

#### **Recommended:**

1. Essential Clinical Immunology, John Zabriskie, Cambridge University Press, 1e, 2009, ISBN-10: 0521704898, 372pp. <http://www.sacema.com/uploads/Essential-ClinicalImmunology.pdf> **or**
2. Basic immunology: Functions and disorders of the immune system 5th ed. Abbas, Abul K. et al., 2015, ISBN: 9780323390828, 352pp.
3. Cellular and molecular immunology - 9th ed. Abbas, Abul K. et al., 2017, ISBN: 9780323479783, 608pp.

#### **Websites:**

Information about the Department of Microbiology and Immunology is available on the website of Medical University of Plovdiv: <https://mu-plovdiv.bg/en/faculties/faculty-of-pharmacy/departments/department-of-microbiology-and-immunology/>, where lectures, program for practical classes, information about exams and more is available.

## **9. Control papers and MCQ**

Students are loaded dynamically and intensively throughout the semester. The presumption is that the method of acquiring knowledge and skills is an important factor in their depth, durability and applicability. Assistant professors monitor students' progress at least twice a term. Ongoing control is performed through MCQ or control assignments. Students are provided with timely information and explanations of the results of the tests to assist in their further preparation. Up to 3 (three) days after the announcement of the results the student has the right to get acquainted with his work.

The results of these examinations are included as a component in the final term mark.

## **10. Individual training and extracurricular work of students**

The independent work is guided by the assistant professor, who guides the student both in the literary sources and in the methods of their mastering. Sample training tests are provided, incl. online, for self-study and student practical classes.

## **11. Collaboration between assistant professors and students**

This cooperation shall be expressed in:

- Assistant's commitment to the student and his/her preliminary preparation, current difficulties in mastering the material and opportunities with an individual learning program to achieve more.
- Use of consultation hours according to an approved schedule announced in the Department.
- Involve students in teams of scientific assignments, researches, projects, circular activities, etc.

## **12. Exams**

1. The ongoing evaluations provided in the curriculum of the specialty are given for:

- The student's results in laboratory and/or seminar classes, individual assignments, the student's work with the research assistant professor, etc.;
- At least two (one in the middle and one at the end of the term) control writings or student works.

2. The term exam consists of 3 components:

- Anonymous entrance test lasting 30 minutes and including 25 questions; students with a minimum of 60% correct answers are allowed to continue for the written exam;
- written exam (anonymous for the above mentioned) lasting 1 hour and 30 minutes; two written exam topics are picked up, the students develop writing a topic of their choice;
- dialogue/oral examination (final stage of the exam), conducted according to the schedule for the day. The final evaluation was made by a committee composed of the examiner and two assistant professors. The written exam is leading in the design process, but the student's persistence, reflected in the current term mark, is also important.

## **13. Evaluation standards:**

The standards for assessing the achievements of the medical student are carefully considered and defined so as to objectify students' assessments, which are not crucial to the subject of the assistant professor.

Description of standards for evaluating clinical immunology assessments:

- Excellent (6) - for excellent knowledge of the information sources, thoroughly mastered key and additional knowledge and skills, well-understood and correctly understood matter, ability to solve complex cases, own thinking and reasoning of decisions.
- Very good (5) - for very well mastered knowledge, a meaningful and correct understanding of the matter in clinical immunology, skills for learning complex case studies.
- Good (4) - for mastering detailed knowledge for solving cases and tasks, but without being able to develop them into independent thinking.
- Average (3) - to use key knowledge and solutions for simple tasks, connected with immunological diagnostics, immunopathogenesis and immunotherapy/prevention of diseases.
- Poor (2) - none of the above mentioned.

When starting a clinical immunology class, students become familiar with the assessment standards, procedures for checking current control, and may receive feedback for their advance throughout the term.

#### 14. Final evaluation

The final grade determines the extent to which the student has achieved the goal of the initial training. It is complex and includes a written final exam score and at least one of the following components:

1. current control assessment (s) (colloquium, MCQ);
2. oral examination.

Other possible components are:

3. the evaluation of laboratory and/or seminar practicals during the term;
4. working with the research assistant professor in the immunology field.

For each component participating in the final evaluation, a coefficient of significance (from 0 to 1) is determined, the total sum of the coefficients must always be 1. The final rating is obtained as the sum of the six-point system scores from the various components, multiplied by the corresponding coefficients of significance.

$Q \text{ final grade} = K1 \text{ Q current control score} + K2 \text{ Q written exam} + K3 \text{ Q oral examination}$

$K1 = 0.20; K2 = 0.50; K3 = 0.30$

If one of the components of the final grade is poor 2, then the final grade is necessarily poor 2.

The components involved in forming the grade and the coefficients of significance for each discipline are determined by the Academic Council with the adoption of this Academic norm of the discipline.

In the term exam the students' written works are evaluated anonymously.

The clinical immunology exam materials are stored and the students are given the opportunity to familiarize themselves with them and the grounds for the evaluation according to the procedure and procedure announced in advance. The period during which students have access to the exam materials and results is no longer than 5 working days after the exam date.

For characterization of the discipline "Clinical Immunology" in this type students are familiar at the beginning of the training.

*This requirement is placed in accordance with the Higher Education Act article 56, paragraph 1 "assistant professors are obliged to develop and publicize, in an appropriate manner, a description of the lecture course they provide, including the titles and sequences of the topics of the course content, reference literature, the form of assessment and the form of assessment of knowledge and skills".*

#### 15. Documentation, storage of results and control of evaluation activities

- Assessed students have the right and obligation to be informed of the regulations, procedures and results of assessment, to make claims and complaints in the event of non-compliance with these rules.
- The student's right within the meaning of the preceding paragraph is valid in the case of identified technical defects or errors (for example: in calculating or application of the grades), as well as major reasons for divergence of actual demonstration of knowledge, skills and purviews and the resulting final evaluation for them.
- Adjustments to the grades in the preceding subparagraph in the student record book, exam protocol or in the general ledger account are allowed only by the discipline holder.
- Any disputes and claims by the students should be made in writing to the assessment team, who should provide a reasoned answer by the end of the next working day.

- Established and proven cases of a serious violation of the student's rights in the assessment of his / her knowledge, skills and purviews are addressed by a written complaint to the Vice rector of quality and accreditation.

The Academic norm for the discipline is approved by a Decision of the Academic Council and is published on the website of MU - Plovdiv.

***Approved:***

***Head of the Department***

***/Prof. Dr. M. Murdjeva, MD, PhD, MFM/***

