

MINISTRY OF HEALTH OF UKRAINE

ODESA NATIONAL MEDICAL UNIVERSITY

**Department of Occupational Diseases and Functional Diagnostics and
Phthisiopulmonology**

International faculty

Syllabus course of elective discipline

Fundamentals of ultrasound diagnostics

Volume	Total ECTS hours 90/ credits 3 (practical classes 30 hours, independent work 60 hours)
Semester, year of study	5 year applicants of higher education , semesters IX- X
Days, time, place	According to the approved schedule of classes of the Department.
Teacher (s):	PhD of philosophy, Associate Professor Prutiian T.L., Associate Professor Zagorodnya L.I., Ph.D., Associate Professor Yamilova T.M., PhD from Medicine, assistant Volyanska V.S.
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Workplace	Department of Occupational Diseases and Functional Diagnostics and Phthisiopulmonology, Therapeutic Department of Odessa Regional Clinical Medical Center, Odessa, Sudnobudivna str., 1
Consultations	Consultations: face-to-face Thursday 14.00-17.00 Online: Tuesday 14-17.00, Saturday 09.00-14.00

COMMUNICATION

Communication with applicants will be carried out through face-to-face meetings. In the case of switching to distance learning, communication with applicants will be carried out using the Internet, Telegram, WhatsApp, Zoom, Microsoft Teams, Viber social networks.

COURSE ABSTRACT

The subject of study of the educational discipline "Fundamentals of ultrasound diagnostics" is a set of theoretical and practical questions aimed at mastering the theoretical principles and methodology of ultrasound examination of internal organs and systems, as well as ultrasound semiotics of the most common diseases.

Course prerequisites and post-requisites (Place of the discipline in the curriculum). The discipline is based on the studied: Ukrainian language (for professional fields), foreign language (for professional fields) medical and biological physics, normal anatomy, pathological anatomy, pathophysiology, pathomorphology, propaedeutics of internal medicine, internal medicine, physiology, traumatology, obstetrics and gynecology, oncology, dermatology, surgery, neurology, nephrology, pediatrics and ensuring the formation of integration with these disciplines and the ability to apply ultrasound methods of patient examination in the process of further training and in the professional activity of a doctor.

The purpose of studying the selective educational discipline "Fundamentals of ultrasound diagnostics" is to acquire basic theoretical knowledge and professional competences of ultrasound examination of internal organs and systems by the student of higher education.

Tasks of the discipline:

- 1) Providing the applicant of higher education with knowledge about the importance of the ultrasound diagnostic method in clinical medicine; advantages and disadvantages; to know the general characteristics of ultrasound diagnostic methods; physical foundations of ultrasound diagnostics; ultrasound biophysics. Artifacts.
- 2) Providing the applicant of higher education with knowledge about new technologies in ultrasound diagnostics (sonoelastography, echocontrast research methods, 3D and 4D). Endoscopic ultrasound methods. About the features of the equipment used for ultrasound examinations; conditions for ultrasound; concept of radiation safety of ultrasound.
- 3) To study ultrasound research methods; modes of ultrasound examination; the use of ultrasound in the diagnosis of internal diseases; methods of quality control of ultrasound research.
- 4) To study the topographical anatomy of a person - in relation to the specifics of ultrasound research;
- 5) To study the general principles of using ultrasound to assess the structure and function of organs.
- 6) To master practical methods of visualization of organs of the abdominal cavity and urinary system, measurement of size and volume, visualization of blood vessels.

7) Master the practical methods and technique of scanning the thyroid gland, measurement of sizes and volumes, visualization of nodes in the thyroid gland, examination of the lymph nodes of the neck.

8) Providing the applicant of higher education with knowledge about ultrasound semiotics of the most common diseases of internal organs.

Expected learning outcomes

As a result of studying a selective academic discipline, the applicant of higher education should **know**:

- the significance of the ultrasound diagnostic method in clinical medicine; advantages and disadvantages;
- general characteristics of ultrasound diagnostic methods; physical foundations of ultrasound diagnostics; ultrasound biophysics; concept of artifacts;
- conditions for ultrasound; factors affecting the reliability of the study; methods of quality control of ultrasound studies; concept of radiation safety of ultrasound;
- methods of ultrasound research; ultrasound examination modes, choice of transducer frequency for examination and image enhancement methods.
- ultrasound anatomy of internal organs;
- ultrasound semiotics of the most common diseases of internal organs.

The applicant of higher education should **be able to**:

- to choose the technique of ultrasound examination and use anatomical landmarks for visualization of organs.
- to have practical methods of visualization of organs of the abdominal cavity and urinary system, to measure the size and volume of organs, to visualize vessels.
- to have practical techniques and techniques for scanning the thyroid gland, measuring the size and volume, visualizing the nodes of the thyroid gland, examining the lymph nodes of the neck.
- determine the leading symptoms and syndromes in the clinic of internal diseases, taking into account the data of ultrasound examination.

COURSE DESCRIPTION

Forms and methods of education. The course is taught in the form of practical classes (30 hours), as well as through the organization of independent work for applicants of higher education (60 hours).

Practical classes are provided with methodical developments for each class, visual teaching aids for each class (presentations, video lectures), the department's information resource, and structured skill control algorithms. The class includes an oral and written survey, solving test tasks, solving situational problems, and working with setting up the ultrasound machine. The teacher uses interactive teaching methods.

Independent work in the study of a selective academic discipline is provided by visual means of learning (video lectures, presentations), the information resource of the department, the subject of independent work, structured algorithms of skill control.

The final control is not conducted, the study of the discipline ends with a credit at the last practical lesson.

Control methods:

- entrance and final knowledge level control tests on the subject of the practical lesson;
- oral answer to questions based on the material of the current topic;
- solving typical and atypical clinical situational problems;
- control of practical skills on an ultrasound machine;
- balance

The study of the discipline is implemented on the basis of the following teaching methods:

- according to the dominant teaching methods (verbal, visual);
- blitz survey;
- solving creative problems;
- drawing up graphic schemes;
- group discussions on problem situations;
- performance of tasks on the ultrasound machine;
- individual control interview;
- logical exercises;
- business games;
- situational tasks;
- performance of individual studies;
- problematic teaching method;
- "brain storm"

Course content

Topic 1. Physical and technical foundations of ultrasound diagnostics.

Topic 2. Anatomy and echoanatomy of the heart and heart vessels. Ultrasound diagnosis of heart diseases.

Topic 3. Fundamentals of ultrasound diagnostics of the respiratory system. Ultrasound diagnosis of lung diseases.

Topic 4. Anatomy and echoanatomy of abdominal organs. Ultrasound diagnostics of abdominal organs (norm). Ultrasound diagnosis of diseases of the abdominal cavity

Topic 5. Anatomy and echoanatomy of organs of the urinary system and male genital organs. Ultrasound diagnostics of the urinary system and male genital organs (norm). Ultrasound diagnosis of diseases of the urinary system and male genital organs.

Topic 6. Fundamentals of ultrasound diagnostics of the endocrine system. Ultrasound diagnosis of diseases of the endocrine system.

Topic 7. Ultrasound diagnostics of the mammary gland (norm). Ultrasound diagnosis of mammary gland diseases.

Topic 8. Anatomy and echoanatomy of pelvic organs. Ultrasound diagnostics in obstetrics and gynecology (norm). Ultrasound diagnosis of diseases in gynecology. Ultrasound diagnostics in obstetrics.

Topic 9. Fundamentals of ultrasound diagnostics of the locomotor system. Ultrasound diagnosis of diseases of the locomotor system.

Topic 10. Ultrasound diagnostics in emergency situations.

List of recommended literature.

Main:

1. Radiation diagnostics. Volume 1. edited by: G.Yu. Blacksmith. Kyiv: "Medicine of Ukraine", 2018. - 302 p.
2. Radiation diagnostics: [In 4 volumes] / Koval G.Yu., Mechev D.S., Miroshnychenko S.I., Sharmazanova O.P. etc./Edited by G.Yu. Koval.—K.: Medicine of Ukraine: T.2. — 2020. — 768 p.
3. Ultrasound examination of the hepatopancreatobiliary system: a study guide for students / N. V. Tumanska, T. M. Kichangina, S. O. Myagkov, O. G. Nordio. – Zaporizhzhia: [ZDMU], 2019. -79 p.
4. Guidelines for clinical echocardiography: manual / V. M. Kovalenko, M. M. Dolzhenko, S. V. Potashev; National honey. Acad. postgraduate education named after P. L. Shupyk MOH of Ukraine, Institute of Cardiology named after M. D. Strazheska National Academy of Sciences of Ukraine. - Kyiv: Nauk. dumka, 2018. - 327 p. : tab., fig. - (Cardiology. Classics and modernity). - P. 307-325.
5. 3. Echocardiographic aspects of internal medicine: a study guide for students of V-VI courses of medical faculties of higher education institutions of the Ministry of Health of Ukraine / V. A. Vizir, I. B. Prykhodko, O. V. Demidenko. – Zaporizhzhia: ZDMU, 2018. – 145 p.
6. Kovalsky O.V. Radiology. Radiation therapy. X-ray diagnostics: assistant. For students higher honey. education closing IV level of accreditation / O. V. Kovalskiy, D. S. Mechev, V. P. Danylevich. - 2nd edition. - Vinnytsia: New book, 2017. - 512 p.
7. Essential radiology for medical students, interns and residents // A. Ahuja. – OMF publishing. - 2017. - 518 p.

8. Myagkov O.P., Myagkov S.O. Atlas of radiation diagnostics of bone and soft tissue tumors. - Zaporizhzhia. – Shamrai G.S. - 2017. - 296 p.

9. Canadian Cancer Society's Advisory Committee on Cancer Statistics. Canadian Cancer Statistics 2016. Toronto: Canadian Cancer Society, 2016.

10. Information and educational environment info.onmedu

https://info.odmu.edu.ua/chair/occupational_diseases_and_functional_diagnostics/files

11. Ultrasound.net.ua - Ukrainian portal of ultrasound diagnostics

EVALUATION

Current control is carried out at the practical classes in accordance with the formulated tasks for each topic. When evaluating educational activity, preference is given to standardized control methods: tests, oral survey, structured written works, discussions, role-playing games, reports.

Current assessment criteria at the practical class

Grade	Evaluation criteria
«5»	The applicant of higher education shows special creative abilities, knows how to acquire knowledge independently, finds and processes the necessary information without the help of a teacher, knows how to use the acquired knowledge and skills to solve problems, is able to produce innovative ways of solving problems, convincingly argues answers.
«4»	The applicant of higher education has a fluent command of the studied volume of material, applies it in practice, freely solves exercises and problems in standard situations, independently corrects the mistakes made.
«3»	The applicant of higher education is able to master a significant part of the theoretical material, but mainly in a reproductive form, demonstrates knowledge and understanding of the main provisions, can analyze the educational material with the help of the teacher, correct errors.
«2»	The applicant of higher education possesses the material at the level of individual fragments, which constitute an insignificant part of the educational material.

Final control. Forms and methods of final control: credit test, issued to the applicant who has completed all sections of the educational program of the selected discipline, actively participated in practical classes, has an average current grade of at least 3.0 and has no academic debt.

Conditions for obtaining additional (bonus) points. Participation in the Scientific research work of the department, preparation of reports and speeches at conferences of young scientists, etc.

Independent work. The evaluation of the independent work of the applicants of higher education, which is provided for in the topic along with the classroom work, is carried

out during the current control of the topic in the corresponding classroom session, as well as at the final control.

EDUCATIONAL DISCIPLINE POLICY

Deadlines and Rescheduling Policy.

Missing classes for unimportant reasons will be made up according to the schedule of the teacher on duty. Absences for valid reasons are worked out according to an individual schedule with the permission of the dean's office.

Academic Integrity Policy. Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in the case of using ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information. Unacceptable in educational activities for participants of the educational process are:
 - using family or official ties to obtain a positive or higher grade during any form of control of learning outcomes or academic performance;
 - use of prohibited auxiliary materials or technical means (cheat sheets, notes, micro-earphones, telephones, smartphones, tablets, etc.) during control measures;
 - passing procedures for control of training results by fake persons.

For violation of academic integrity, applicants may be held to the following academic responsibility:

- decrease in the results of evaluation of control work, evaluations on employment, credits, etc.;
- retaking the assessment (test, final exam, etc.);
- appointment of additional control measures (additional individual tasks, control works, tests, etc.);
- conducting an additional inspection of other works authored by the violator.

Attendance and Tardiness Policy. Attendance and work at classroom classes is mandatory for obtaining a satisfactory grade. The applicant of higher education who is late for class can attend it, but if the teacher has put "nb" in the journal, he must complete it in the general order.

Mobile devices. It is permissible to use mobile devices during the lesson with the teacher's permission.

Behavior in the audience. The behavior of applicant and teachers in the classrooms should be working and calm, strictly comply with the rules established by the Regulations on academic integrity and ethics of academic relations at Odessa National Medical University, in accordance with the Code of Academic Ethics and University Community Relations of Odessa National Medical University, Regulations on Prevention and detection of academic plagiarism in the research and educational work of applicants of higher education, scientists and teachers of Odessa National Medical University.