SULAWE LLL course description

Code	Title of the course ***Veterinary telemedicine***

1. Learning Objectives of the course

Qualification objectives

overall objectives of the course

Veterinary telemedicine is a modern and leading field of veterinary services, which had formed at the border of such sciences as veterinary medicine, medicine, telecommunications and information technologies. The main task of veterinary telemedicine is the organization of providing high-quality veterinary services at a distance. It had intended for use in remote regions, mountains, military operations, disaster medicine.

Which knowledge, skills, competences should be acquired disciplinary and interdisciplinary?

As a result of studying this course, the student should know:

- features of construction and principles of operation of telemedicine systems;
- equipment for telemedicine;
- tasks and possibilities of telemedicine;
- legal principles of telemedicine organization;
- the structure of the telemedicine system of Ukraine.

Be able to: - choose equipment for the organization of the telemedicine system depending on the tasks;

- organize and work with existing telemedicine servers to organize communication and transfer medical data;
- choose medical data transfer standards.

Summary of the Content

Which professional, methodological, practical and interdisciplinary contents will be delivered?

The purpose of the educational discipline is to give listeners basic knowledge about veterinary telemedicine, the organization of various forms of communication between a patient and a veterinarian, between doctors during teleconferences, about the forms and standards of transmission of veterinary data. Issues of network organization during video conferences, telemonitoring, biotelemetry, etc. Study of the legal basis of veterinary telemedicine.

Tasks study of the academic discipline is the acquisition of theoretical and practical knowledge on the organization of veterinary telemedical services. To study the history of the creation of veterinary telemedicine, the basics of veterinary data transmission, the organization and structure of the veterinary telemedicine system of Ukraine, registration and data transmission equipment.

At the professional level, course participants will gain new knowledge on the methods of telemedical services in veterinary medicine, the organization of telecommunications and the creation of relevant databases.

Target group

Who is the intended target group of the course?

the target group is:

- Specialists of veterinary medicine clinics
- Farmers
- Volunteers of animal shelters

- Owners of pets and companion animals - Post-graduate students and applicants for a master's degree in specialty 211- Veterinary medicine
Teaching/learning forms (summary) e.g., online, hybride, problem lecture, lecture-dialogue, binary lecture, lecture-consultation, seminar (- with exercise), lab work, workshop etc. Problem binary lecture, seminar with exercises, case method.

2. Preconditions for participation

Knowledge, skills, competences	Which knowledge, skills, competences are required for successful participation?
Integral competence	The ability to solve complex tasks and problems in the field of veterinary medicine, which involves conducting research and/or implementing innovations and characterized by the uncertainty of conditions and requirements.
General competences	1. Ability to abstract thinking, analysis and synthesis. 2. Ability to apply knowledge in practical situations. 3. Skills in using information and communication technologies.
Special competences	1. The ability to use tools, special devices, devices, laboratory equipment and other technical means to carry out the necessary manipulations during professional activity. 2. The ability to conduct clinical research with the aim of formulating conclusions about the condition of animals or establishing a diagnosis. 3. Ability to organize and conduct laboratory and special diagnostic studies and analyze their results. 4. Ability to plan, organize and implement measures for the treatment of animals of various classes and species suffering from non-contagious, infectious and invasive diseases

Program learning outcomes	1. Collect anamnestic data during registration and examination of animals, make decisions regarding the choice of effective methods of diagnosis, treatment and prevention of animal diseases. 2. Formulate conclusions regarding the effectiveness of selected methods and means of keeping, feeding and treating animals, prevention of contagious and non-communicable diseases, as well as production and technological processes at enterprises for keeping, breeding or exploiting animals of various classes and species 3. To propose and use expedient innovative methods and approaches for solving problematic situations of professional origin. 4. Know the principles and methods of marketing and management of veterinary products and services in veterinary medicine. 5. Know the rules and requirements of biosafety, bioethics and animal welfare. 6. Carry out accounting reporting during professional activity. 7. Carry out educational activities among industry workers and the population. 8. To have specialized software tools for performing professional tasks

3. Recognition of participation

e.g., Certificate of participation issued by XX university or other recognition possibilities e.g Recognised as a training course for Veterinarians 1. Course participants will receive a certificate of professional development for 1 credit. 2. The course is approved as a discipline chosen by the students of specialty 211- Veterinary medicine

4. Organisation of the course

Responsible for the course Prof. Dr. please insert the name candidate of veterinary sciences, associate professor Lyudmila Parkhomenko		
Duration e.g., 1 or 2 days or 6-12 hours	**Max. number of participants**	**Preparation/ follow up/ self-study**
30 hours	**20**	**18/2/10**

5. Structure of the course content

Title of training section	Duration and % of the entire program	Methods/Formats used	Responsible person
Topic 1. The history of the development of veterinary telemedicine technologies. The main stages of the establishment and development of veterinary telemedicine in the world and in Ukraine. World knowledge of remote transmission of veterinary data.	1	A problematic lecture	Parkhomenko L.I.
Topic 2. Basic concepts and definitions of telemedicine. Concepts and areas of use of telemedicine. Types of transmission of medical data at a distance: teleconferences, telelearning, teleassistance, bioradiotelemetry, home telemedicine. TV kiosks.	1	A problematic lecture	Parkhomenko L.I.
Topic 3. Organization of the national veterinary telemedicine system of Ukraine. Its members are companies that develop veterinary telemedical software and information. Regulatory and legal basis of veterinary telemedicine. State telemedicine programs.	2	A problematic lecture	Parkhomenko L.I.
Topic 4. Biotelemetry and telemonitoring. Tasks, areas of application, hardware and software, principles of building telemedicine systems. Types of biotelemetry: space, aviation, military, clinical, disaster telemedicine.	1	Workshop with exercises	Parkhomenko L.I.
Topic 5. Teleconsultation. Teleassistance. Classification, areas of application, principles of building teleconsultation and teleassistance systems. Equipment used. Keeping documentation during teleconsultation	2	case assignment	Parkhomenko L.I.
Topic 6. Home telemedicine. Telescreening. Distance education of doctors. Tasks, areas of use, features of building home	1	case assignment	Parkhomenko L.I.

telemedicine systems, equipment.			
Theme 7. Medical and diagnostic equipment for telemedicine. Means of visualization, registration and processing of medical data, measurement of physiological indicators, broadcasting of examinations. Means of remote control of medical devices. Means of digital visualization.	2	problematic lecture	Parkhomenko L.I.
Theme 8. Medical information compression protocols. Data transfer protocols in telemedicine.	1	Case method	Parkhomenko L.I.
Topic 9. General principles of building telemedicine networks. Concept and structure of networks. Types of networks, network topology.	1	Problem binary lecture	Parkhomenko L.I.
Topic 10. Reference model of open systems interaction (OSI). Model, structure of the OSI model. Physical and channel level organization. Data transmission media, MAC addressing. Network layer of the OSI model, IP addressing. Transport, session, application, and presentation layers. Protocols and standards of each level	1	Problem binary lecture	Parkhomenko L.I.
Topic 11. Technologies of wireless telemedicine systems. The concept of a wireless network. Technologies Z-Wave, ZigBee, Bluetooth LowEnergy, ANT/ANT+, Wireless USB, Wi-Fi,	1	Problem binary lecture	Parkhomenko L.I.
Topic 12. Legal provision of telemedicine Laws on telemedicine, orders, provision of rights and obligations of users of telemedicine services. Algorithms for providing telemedical services.	1	method of cases	Parkhomenko L.I.
Topic 13. Information protection in telemedicine. Methods and methods of information protection during data transmission over a distance.	2	Workshop with exercises	Parkhomenko L.I.

Topic 14. Application of cloud technologies in telemedicine. Telemedicine software and servers in Ukraine and the world.	1	Workshop with exercises	Parkhomenko L.I.

RECOMMENDED BOOKS

1. Creating New Services Based on the Formation of a Strategic Community with Customers: A Case Study of Innovation Involving IT and Multimedia Technology in the Field of Veterinary Medicine M. Kodama Blackwell Publishers Ltd 2000. 108 Cowley Road, Oxford OX4 1JF and 350 Main St, Malden, MA 02148, USA. Volume 9 Number 3 September 2000
2. Bashshur R, Doarn CR, Frenk JM, Kvedar JC, Woolliscroft JO (2020) Telemedicine and the COVID-19 Pandemic, Lessons for the Future. Telemed J E Health 26:571–573. https://doi.org/10.1089/ tmj.2020.29040.rb
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4. du Toit M, Malau-Aduli B, Vangaveti V, Sabesan S, Ray RA (2019) Use of telehealth in the management of non-critical emergencies in rural or remote emergency departments: a systematic review. J Telemed Telecare 25: 3-16. https://doi.org/10.1177/1357633X17 734239
5. Ward MM, Jaana M, Natafgi N (2015) Systematic review of telemedicine applications in emergency rooms. Int J Med Inform 84:601– 616. https://doi.org/10.1016/j.ijmedinf.2015.05.009
6. Ekeland AG, Bowes A, Flottorp S. Effectiveness of telemedicine: A systematic review of reviews. *Int J Med Inform*. 2010;79(11):736-771.
7. The telemedicine community readiness model—successful telemedicine implementation and scale-up - PMC (nih.gov)
8. Teller, L. 2023. Advancing telehealth to enhance and expand patient care. J. Am. Vet. Med. Assoc. 261(2), 148
9. Williams, A. 2023. Telemedicine has a valid place in a modern veterinary profession. Vet. Rec. 192(2), 87.
10. Wells, J., Watson, K., Sharma, M., Davis, R.E., Gruszynski, K., Robertson, S.R. and Nahar, V.K. 2023. Application of the multi-theory model to explain veterinarians' intentions to use telehealth/ telemedicine. Vet. Rec. 192(4), e2385.
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12. Ashraf M. Abu-Seida1, Abdulrahman Abdulkarim, Marwa H. Hassan Veterinary telemedicine: A new era for animal welfare Open Veterinary Journal, (2024), Vol. 14(4): 952-961 DOI: 10.5455/OVJ.2024.v14.i4.2

Information resources

1. https://vetonline.pro/uk/subscription
2. https://ftl.ua/ru/ftl-predstavila-petscare-na-veterinarnom-forume-csvm/
3. American Veterinary Medical Association Practice Advisory Panel. (2017). *Final report on telemedicine* (p. 45). American Veterinary Medical Association. Available from: https://www.avma.org/sites/default/files/resources/Telemedicine-Report-2016.pdf

4. Cary, M.,Massecar, A. (2017). Veterinary Telehealth: What Is It, Where Are We, and What's Next? Today's Veterinary Practice. Available from: https://todaysveterinarypractice.com/inside-navcveterinary-telehealth-whats-next/ \
5. Devi, S., Singh, R. D., Ghasura, R. S., Sharma, M. K. & Sharma, M. C. (2015). Telemedicine: A new rise of hope to animal health care sector-A Review. *Agricultural Reviews*, 36(2), 153. DOI: https://doi.org/10.5958/0976-0741.2015.00018.5
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Additional literature

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15. Глобальні прогнози та тенденції у сфері ІТ-медицини. URL: https://evergreens.com.ua/ua/articles/telemedicine-vs-telehealth.html
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17. Про затвердження нормативних документів щодо застосування телемедицини у сфері охорони здоров'я: Наказ Міністерства охорони здоров'я України № 681 від 19.10.2015 р. URL: www.zakon5.rada.gov.ua/lows/show/z1400-15
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