	U-LAS70 10002 SE50					
< >	ILAS Seminar-E2 :Applying Data Science and AI to Healthcare - Novel Approaches in Modern Epidemiology ILAS Seminar-E2 :Applying Data Science and AI to Healthcare - Novel Approaches in Modern Epidemiology					AKHMETZIANOVA, Renata
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	2026	(1)	10 (10)			
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	Healthcare / Epidemiology / Personalized medicine / AI					

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This seminar introduces students to the epidemiology of communicable and non-communicable diseases, providing basic knowledge of disease pathogenesis, genetics, treatment, and prevention.
A key highlight of this seminar is the focus on the future of healthcare. We will discover how data science and artificial intelligence (AI) are transforming disease diagnosis, monitoring, and management, enabling more effective, precise, and personalized approaches to medicine.
The classes incorporate interactive work and discussion-based activities. Students will have the opportunity to present on selected topics and discuss current problems and potential solutions. In addition, the seminar will address the real challenges healthcare systems face when implementing AI technologies.
By the end of the seminar, students will not only understand today's major health challenges but will also be inspired to explore how science, technology, and innovation can revolutionize the future of healthcare.

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1. Understand the basic principles of epidemiology and the global impact of communicable and non-communicable diseases.
2. Describe the risk factors, mechanisms, treatment and prevention of common communicable and non-communicable diseases.
3. Recognize how artificial intelligence can be applied in healthcare to support disease diagnosis and management.
4. Evaluate challenges and limitations of implementing AI in healthcare systems
5. Develop critical thinking and communication skills

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The seminar includes interactive lectures and student presentations.
1. Course Introduction. The basic principles of epidemiology
2. The global burden of non-communicable and communicable diseases.
3. Introduction to non-communicable diseases: key facts, prevalence, risk factors, and socioeconomic impact. Applications of AI in the detection and diagnosis of non-communicable diseases
4. Non-communicable diseases: cardiovascular diseases
5. Non-communicable diseases: cancer
6. Non-communicable diseases: metabolic diseases

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7. Non-communicable diseases: neurological diseases
8. Introduction to communicable diseases: key concepts, routes of transmission, and global impact. AI in epidemic and pandemic management
9. Communicable diseases: HIV/AIDS
10. Communicable diseases: HPV
11. Communicable diseases: tuberculosis
12. Communicable diseases: COVID-19
13. AI in advancing drug discovery and clinical research
14. Challenges in AI implementation
15. Feedback

Changes in order and/or content may occur depending on the number of students and the specific needs of the class.

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Open to students from all majors, this course is designed to provide an understanding of the epidemiology of common diseases and to explore how science and technology work together to address today's health challenges.

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Attendance and active participation: 30%
Midterm assignment: 30%
Quality of student presentations and discussions: 40%

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Gordis, L.   Epidemiology (5th ed.)   Elsevier/Saunders, 2014   ISBN:978-1455737338

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Additional literature and references will be introduced during the lectures.

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Reviewing lecture slides, completing quizzes, and doing homework will enhance understanding and reinforce learning in class. Lecture slides will be provided.

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If you have any questions, please feel free to email me or schedule a time to meet in person.

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