

COURSE SYLLABUS

Large Language Models in Business and Finance

ECTS 5

Misija ZSEM-a je prenijeti vrijednosti, znanja i vještine potrebne studentima za dugoročan uspjeh u globaliziranom poslovnom svijetu izloženom stalnim tehnološkim i tržišnim promjenama.

The mission of ZSEM is to transfer values, knowledge, and skills that students need for long-term success in a globalized business world undergoing constant technological and market transformations

INSTRUCTOR

prof Andrej Novak, PhD

Consultations

Before and after class and by appointment

CREDIT HOURS

Lectures + Exercises	45 hours
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Learning Outcomes:

By the end of this course, students should be able to:

1. Explain key concepts, such as neural networks, transformers, and large language models, without the need for deep technical knowledge.
2. Understand the impact of AI technologies on various industries, with a focus on economics, finance, and business decision-making.
3. Explain how AI models like ChatGPT are used in automation, customer service, financial modeling, and other business applications.
4. Critically evaluate the limitations and common issues related to AI models, such as bias, ethical concerns, misinformation, and accountability.
5. Discuss the future developments and potential of LLMs in economic contexts, including automation of cognitive tasks and their implications for jobs and markets.

Course Breakdown:

1. Introduction to AI and LLMs (6 hours)

Introduction to Artificial Intelligence. Defining AI and its relevance to the economy. Historical context of AI and economic revolutions. Basic AI concepts: automation, neural networks, machine learning. Large Language Models Explained. What are LLMs (e.g., GPT, ChatGPT)? How LLMs work (at a high level): neural networks and transformer architectures. Practical examples of LLM applications in business and society.

2. The Mechanics of LLMs and Neural Networks (6 hours)

What is Machine Learning? Introduction to supervised, unsupervised, and reinforcement learning. How LLMs “learn” from data (training processes, model parameters). Neural Networks and Deep Learning. Simplifying neural networks and deep learning. How LLMs predict language: from data to meaningful output (the “next-word prediction”). Applications of neural networks in economics and business.

3. Economic Applications of LLMs (6 hours)

LLMs in Financial Modeling and Decision-Making. Case studies of LLMs in finance (e.g., predictive analytics, portfolio management). Automation in economic forecasting and market predictions. Applications in customer service, marketing, and HR.

4. Limitations, Risks, and Ethical Considerations (6 hours)

Ethical Issues and Risks in Using LLMs. Bias and fairness in LLM outputs. Risks of misinformation, and accountability challenges. Economic impact: job displacement vs. job creation. Privacy, Security, and Data Ownership. Legal and regulatory considerations: GDPR, data privacy laws.

5. The Future of LLMs in Economics (6 hours)

Trends in AI and LLM Research. Ongoing advancements: fine-tuning, reinforcement learning, and multimodal models. How LLMs can influence policy decisions. Long-term predictions: the role of AI in shaping the future of work, productivity, and innovation.

Assessment:

1. Final Project (50%): Group project analyzing a real-world economic application of LLMs, including a case study of an industry or business that has adopted LLMs (e.g., finance, marketing, customer service).
2. Final Exam (20%): Written exam covering technical basics, with a focus on high-level conceptual understanding and economic implications of LLMs.
3. Participation (30%): In-class discussions, short quizzes, and case study presentations on LLM applications.