



Course Specification Document

Title	Data Mining
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Credits	2.5 ECTS
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Aims	This course aims to introduce the student to data mining tools (association rules, clustering), and the processes of data preparation that should be carried out before starting the mining process (cleaning, transformation, integration). The goal is to enable the student to explore new knowledge and hidden patterns in the data.
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Intended learning outcomes
On successful completion of this course, the student will be able to: <ul style="list-style-type: none">• Understand data preparation methods for mining.• Familiarize himself with the concepts of dimension reduction, association rules, clustering, and their algorithms.• Utilize open-source mining software such as "Weka."• Write mining algorithms in programming languages.• Use pre-built libraries and prepared datasets for mining.

Syllabus
<ul style="list-style-type: none">• Introduction - Initial data processing: Introducing data mining, presenting the processes of initial data processing: cleaning, integration, transformation, and reduction of data size.• Dimensionality reduction methods: Defining the concept of dimensionality reduction and its importance, analyzing Principal Component Analysis.• Association rules: Defining association rules, their types, scope of use, frequent itemsets, algorithms for calculating frequent itemsets (Apriori, Fp Growth), discovering association rules.• Clustering: Defining clustering, its types, scope of use, partition clustering algorithm K-means, hierarchical clustering algorithms Agnes, Diana, density-based clustering algorithm DBScan, High-dimensional clustering (Clique algorithms, Proclus).