


Course Title	Frequentist and Bayesian statistical methods in real use practice	
Instructor	<p><i>Tomas Karel, Ph.D.</i> <i>Prague University of Economics and Business</i> tomas.karel@vse.cz www.tomaskarel.cz</p>	
Language of instruction	English	

Aim of the course, Learning Objectives
<p>At the end of the course, students will be able to independently formulate and analyze problems, use rational decision-making theory not only in economic but in general situations, and use the basic tools of the Bayesian and Frequentist approach and their advantages. The course is mainly focused on the Bayesian approach that has recently found wide application in many fields (from economics, insurance, macroeconomic models, and medical to biostatistics). Knowledge gained in the course students can use in their future career and daily life decision making. The course will further help to pass of the other basic and advanced statistics courses, and deepens their knowledge of the concept of Bayesian and classical frequentist theory of probability.</p>

Course Contents	
<p>Part 1 May 23rd 1 pm – 4 pm</p>	<ul style="list-style-type: none"> • Data visualization (how to lie using graphs and statistics) • Chance, coincidences, and randomness (their role in daily life) • Probability theory • Classical definition of probability – advantages and disadvantages • Frequentist definition of probability – advantages and disadvantages • Law of large numbers • Subjective definition of probability (degree of belief) – advantages and disadvantages • Difference between Frequentist and Bayesian approaches • History of Bayesian and frequentist statistics
<p>Part 2 May 24th 2 pm – 5 pm</p>	<ul style="list-style-type: none"> • Confuse of conditional probabilities (Conditional probabilities paradoxes) • Bayes' rule • Application of Bayesian statistics • Calibration experiments • Prior and posterior probabilities • Decision-making theory • How to use the theory of probabilities for rational decisions • Bernoulli equation • Hazzard games and probability • Problems and paradoxes to use rational making decisions theory in real life

Course literature (cases, papers, online material...)

Author: Bolstad, W. M. a Curpan, J. M.
Title: Introduction to Bayesian statistics.
Publisher: John Wiley & Sons, 2016.
Edition and year: 2016. New York

Further readings suggested by the lecturer(s)

Author: Albert, J. H., Rossman, J. A.
Title: Workshop Statistics: Discovery with Data, A Bayesian Approach
Publisher: Key College
Edition and year: 2001
Link: https://bayesball.github.io/nsf_web/workshop.bayes.pdf