COURSE DESCRIPTION CARD - SYLLABUS

Course name
Statistical forecasting methods in aviation [S1Lot2-ORL>MPSwL]

Course

Field of study
Aviation

Year/Semester
3/6

Area of study (specialization)
Air Traffic Organisation

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
15

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Knowledge: Basic knowledge of mathematical statistics Skills: the ability to solve research problems using scientific methods Social competences: the ability to precisely formulate questions; the ability to define priorities important in solving the tasks set for him; the ability to formulate a research problem and search for its solution, independence in problem-solving, the ability to cooperate in a group.

Course objective

To acquaint the student with statistical models used to develop forecasts and basic data processing in statistical tools

Course-related learning outcomes

Knowledge:
1. has knowledge of the method of presenting test results in tabular and graph form, performing the analysis of measurement uncertainties [L1_W10]
2. the student knows the basic probability distributions. The student knows the basic concepts of mathematical statistics. The student knows various methods of statistical inference. Has an ordered, theoretically founded knowledge of mathematics used to analyze the results, create mathematical

models and their adaptation to the numerical code [L1_W16].
3. has the ability to self-educate with the use of modern didactic tools, such as remote lectures, websites and databases, didactic programs, electronic books [L1_W22]

Skills:
1 . the student can use theoretical probability distributions. The student is able to analyze and interpret statistical data. The student is able to use the methods and tools of mathematical statistics in engineering practice [L_U15]
can obtain information from various sources, including literature and databases, both in Polish and in English, integrate them properly, interpret and critically evaluate them, draw conclusions and exhaustively justify their opinions [L_U01]

Social competences:
1 . is aware of the importance of knowledge in solving engineering problems and knows examples and understands the causes of malfunctioning engineering projects that have led to serious financial and social losses or to a serious loss of health and even life [L_K02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lecture: assessment of knowledge and skills demonstrated on the written test,it is possible to pass the lecture based on activity and assessment of project classes
Design: assessment based on the completed design task

Programme content

Data visualization methods, Multivariate analysis,
Basic and advanced techniques of forecasting and analysis of time series.
Basic concepts (stochastic process, time series components) and a wide range of methods enabling the formulation of forecasts and assessment of their quality (trend estimation, seasonal fluctuation analysis, exponential smoothing, autocorrelation and partial autocorrelation functions).

Course topics

The lecture program includes:
1. Basic statistical concepts used in forecasting
2. discussion of various forecasting methods
3. Regression functions and building models based on time series
The design class program includes:
1. discussion of the design task
2. Collecting the data necessary to model the forecast
3. Data validation - data selection
4. Construction of the model
5. Overview of the forecast

Teaching methods

Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character,
Project method (individual or team implementation of a large, multi-stage cognitive or practical task, the result of which is the creation of a work)

Bibliography

Basic:
Rabiej M., Analizy statystyczne z programami Statistica i Excel, Helion, 2018.

Additional:
Internetowy podręcznki StatSoft https://www.statsoft.pl/textbook/stathome.html

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00