

01NAEX - Lecture 00

General information on the course

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Basic information

Duration of Course:	13 weeks.
Schedule:	Every Tuesday 09:00 to cca 11:30, room T-211.
Type of Assessment:	exercises, homeworks, and final report.
Evaluation:	6 step scale (A,B,C,D,E,F).
Qualified Prerequisites:	Regression Analysis, Experience with programming in R or in Python.
Scope and Form:	lectures, discussion of exercises in lecture room, exercises in groups, homework exercises, reports.
Guarantee of the Course:	Ing. Jiri Franc Ph.D. & Doc. Ing. Tomas Hobza Ph.D.
Teaching	Ing. Jiri Franc Ph.D.

Goal of the 01NAEX course

- ▶ The main aim of this course is to learn how to design and analyse an experiment where variation is present. Given experimental conditions, the main challenge is to formulate experimental plans which will provide informative data suitable for statistical analysis.
- ▶ Secondary goal is to learn how to build a tiny project from beginning (measure data) to final presentation of the analysis, improve your data analysis skills and think about data processing in many aspects.

Outline of the course (can be changed :)

1. Introduction and simple comparative experiments
2. Single factor experiment ANOVA
3. Factorial design
4. Blocking Latin Greco BIBD
5. 2k factorial design I
6. 2k factorial design II
7. 2k factorial design - Blocking and Center point
8. 2k fractional factorial design
9. 3k factorial design
10. Random factors mixed models
11. Nested and split plot
12. Longitudinal Data Analysis
13. Final Project

Assesment and Evaluation details

The system of assesment and evaluation of the 01NAEX course is following:

Final grade is primary based on **Final written report** and examination based on discussion of the project (scheduled dates during the exam period).

Attendance is voluntary, but if you miss the lecture, you have to elaborate and hand the corresponding exercise (R or Python Jupyter NB is enough). Two missed lectures are tolerated without penalization.

Not satisfy the condition \Rightarrow -1 grade each miss.

Elaborate and hand **two** homework exercises in satisfactory quality.

Not satisfy the condition \Rightarrow -1 grade each.

Main Literature:

- ▶ **D. C. Montgomery (2012): Design and Analysis of Experiments, 8th Edition, John Wiley and Sons**
Student Companion Site, Montgomery: Design and Analysis of Experiments, 8th Edition: on <http://bcs.wiley.com>

Additional resources used in the course:

- ▶ A. Dean and D. Voss (1999): Design and Analysis of Experiments, Springer
- ▶ Online course of Stat 503 Design of Experiments:
<https://onlinecourses.science.psu.edu/stat503/>
- ▶ DTU course 02411:
Statistical Design and Analysis of Experiments
- ▶ R Companion to Montgomery's Design and Analysis of Experiments:
<http://www.aliquote.org/articles/tech/dae/>