Full name of the subject: Statisztika gyógyszerészeknek (elmélet+gyakorlat)

Program: undivided program (pharmaceutical)

Schedule: full-time

Short name of the subject:

English name of the subject: Statistics for pharmacists (theory+practice)

German name of the subject: Statistik für Pharmazeuten (Vorlesung + Praktikum)

Neptun code of the subject: GYKGYH282G1A

Type of registration: obligatory/obligatory elective/elective/criteria requirement

Responsible department: Department of Pharmacodynamics

Responsible tutor: László Tóthfalusi **Contact information: totlasz@net.sote.hu**	**Title, academic degree: D.Sc.**
Name of the persons responsible for the teaching of the subject: László Tóthfalusi	**Title, academic degree: D.Sc.**

Classes per week:
    2 lecture(s)
    2 practice(s)
	Credit point(s):
	
	    3

Professional content, intent of acquirement and it's function in order to implement the goals of the program:

The aim of the course is to give an overview of statistical methods from a pharmaceutical viewpoint.

Short description of the subject:

In the lectures we review the theoretical basis of the methods. The purpose of the exercises is twofold: On the one hand, to provide examples of the use of statistical tools in different fields of pharmacy (quality control, analytical chemistry, technology development, clinical trial design, pharmacovigilance, economic activity). On the other hand, an introduction to the free and widely used statistical program, the R programming environment.

Course data							
Recommen-ded term	**Contact hours (lecture)**	**Contact hours (practice)**	**Contact hours (seminar)**	**Individual lectures**	**Total number of contact hours/semes-ter**	**Normal course offer**	**Consultations**
6	2	2			56	Autumn semester* Spring semester* Both semesters* (* Please underline)	

Topics of theoretical classes (pro week):
Week 1: Descriptive statistics
Week 2: Probability theory
Week 3: Sample distributions, estimation
Week 4: Parametric and nonparametric statistical tests
Week 5: Linear regression
Week 6: Multivariate linear regression model
Week 7: Extension of the linear regression model
Week 8. Multivariate ANOVA, study design
Week 9: Categorical data analysis
Week 10: Survival analysis
Week 11: Longitudinal data, nonlinear regression
Week 12: Statistical evaluation of clinical trial data
Week 13: Statistical foundation of epidemiology
Week 14: Time series, economic applications

Topics of practical classes (pro week):

Week 1: Using R and RStudio, Data Types
Week 2: Elements of the R programming language
Week 3: Data import, Data cleansing, Descriptive statistics in R
Week 4: Statistical graphics, making a presentation in R.
Week 5: Simulation in R
Week 6: Group comparison in R
Week 7: Linear regression problems
Week 8: Quiz 1
Week 9: Multivariate linear regression problems
Week 10: Experimental design task
Week 11: Statistical processing of experimental data
Week 12: Quiz 2
Week 13: Project presentation 1
Week 14: Project presentation 2

Schedule of consultations:
At scheduled times.

Prerequisites:
GYKEGY112E1A Mathematics for pharmacists
GYKGYI248G1A Physiological pharmaceutics and pharmaceutical dosage forms
GYKDEI107G1A Informatics

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:
Participation in at least 75% of the practice sessions is mandatory. The retake quiz on the last week of the semester is needed if one of the quiz opportunities are missed or if a quiz result is below the acceptable minimum. Accepted project presentation.

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results:

Two quizzes scheduled at weeks 8 and 12. Retake is possible at the last week.

Requirements of signature:

Both quizzes must be above the passing level.

Number and type of projects students have to perform independently during the semester and their deadlines:

One independent project must be presented.
The topic is free but should be suitable to demonstrate of the application of statistical tests and graphics.

Type of the semester-end examination: signature/practical grade/semi-final/final

Form of the semester-end examination:
none

Prescribed practices outside of the university:

Scientific, course related researches, publications, assays:
Recommended textbooks:
David Bock, Paul Velleman, Richard De Veaux, Floyd Bullard. Stats: Data and Models, Pearson (2019)
William Mendenhall, Robert J. Beaver, Barbara M. Beaver. Introduction to Probability and Statistics, Cengage (2019)

Necessary equipment:

Internet access

The course description was prepared by:

Lászlo Tothfalusi. D.Sc.