Introductory Courses of Statistics for Students of the Economic University: What to Teach and Why?

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There are six faculties at the Prague University of Economics, five in Prague and one in Ceske Budejovice, the town in Southern Bohemia. At our department of statistics we organize the learning of Introductory Statistics for all five Prague faculties (Faculty of Finance and Accounting, Faculty of International Relations, Faculty of Business Administration, Faculty of Informatics and Statistics and finally Faculty of Economics and Public Administration). This learning is common and compulsory for all students of the University, so each student has the same statistics. Some other universities in the Czech Republic use the different model – each faculty has their own department of statistics and teaches statistics for their students only. This alternative model has an obvious advantage – learning of statistics could be adjusted for specifics of the branch. On the other hand, in our model student could met the colleagues from different branches, secondly we save money and teachers (lectures are joint for all students of the University).

We teach statistics in two semesters. In each semester (our semester has 13 or 14 weeks of teaching and 6 weeks for exams) we have 3 hours per week (one two-hour lecture each week and one two-hour exercise every two weeks).

The first course (Probability and Statistics) provides students with basic statistical procedures for data processing from research and from the other areas. This course aims at education in the sphere of descriptive statistics and simple data processing and presentation using tables and graphs, elementary probability calculus, random variable, probability distributions, elements of statistical inference. It includes one-dimensional descriptive statistics, characteristics of numerical variable, simple data processing and presentation, basic operations with events and with their probabilities, random variable, basic probability distributions, sample types, sampling methods, elements of statistical inference, point estimates, confidence interval estimates, statistical hypotheses testing, selected parametric and nonparametric tests and goodness-of-fit tests.

The second compulsory course (Statistical Methods) focuses on knowledge and skills in the sphere of statistical methods of dependence investigations, methods of time series analysis and forecasting and the most commonly used types of index numbers. It includes methods of measuring dependence among numeric and categorical data (regression analysis, correlation analysis, analysis of variance, contingency tables), methods of time series analysis (elementary characteristics of time series, time series models, decomposition of time series, simple models of trend, seasonal adjustment, models with variable parameters – moving averages and exponential smoothing, time series forecasting and analysis of residuals) and finally the index numbers (individual and aggregate index numbers).

These courses are ended by credit tests (each course) and bachelor's examination. Credit tests are based on two written tests and a written homework.

At both courses we use special software. Till this semester we use Statgraphics, which is very good for pedagogical purposes, for the next year we have bought a license of SAS. This software is more robust, but many colleagues are afraid of their complexity and intricacy. There are some opinions, that Microsoft Excel is sufficient for introductory courses. This spread-sheet program has an advantage – it is available for students, they have often an Excel at their PCs at home.

Now we have to solve three topical problems: firstly, we have a little time for exercises. There is very difficult to exercises the lecture (which is two-times longer than the exercise) and show special statistical software. During exercises it is also compulsory to write two tests per semester, so there is no time for exercising themes at the end of the outline (index numbers, which could be very useful for students, maybe more useful than probability). The second problem is caused by joint learning for students from different branches (e. g. informatics and international relations), because they have very different knowledge of exact disciplines, mainly of mathematics. Some students have a basic knowledge of probability from a high school, but at some schools there is no learning of basic combinatorial and probability analysis. The third problem is organizational: each teacher has the exercises for different lecturers (e.g. one person has ten student groups from four lecturers), so there is very difficult issue to make a connection between lecture and exercise.

At some colleges (not universities!) in the Czech Republic there is less time for teaching statistics. They usually teach descriptive statistics, index numbers and economic statistics. It is a question, which approach is better. For university students, for example understanding of probability thinking is necessary.

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