UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Statistics For Business (blended)

2021-3-E3301M159

Learning objectives

The objective is to provide students with a solid foundation concerning the most widely used statistical techniques for applying QC in a company. The student will learn the ability of applying adequate techniques for analyzing the quality of the good production.

As far as it concerns the ability of putting knowledge in practice, the student will learn how to interpret the obtained results, and will develop his own point of view in reading tables and graphs concerning the quality of productive processes.

Finally, the student will be aware of the limits of the applied statistical techniques, and will be able to decide if recurring to more sophisticated techniques.

Contents

This course presents the basic methodology for statistical quality control (QC). The first part concerns some inferential statistical techniques; the second part presents basic QC topics; the third part focuses on statistical process control and control charts.

The contents of the course can be understood by students that overcome the exam of the II year course “Metodi Statistici”.

The contents of inferential statistics are more applied than those of the same year course “Inferenza Statistica”, since they actually are QC oriented.

Detailed program

The course is divided into three sections:

Inferential tools: pointwise estimation, for the mean, the variance, the percentage, the difference between two means; confidence interval estimation: for the mean, the variance, the percentage, the difference between two means; statistical tests: statistical hypotheses, type I and type II errors, test statistic, acceptance and rejection regions, power function, sample size determination through the noncentrality parameter, p-value; tests are built for: the mean, the variance, the percentage, the difference between two means, the normality of distributions.

Quality Control tools: QC terminology, basic QC tools, graphics (steam&leaf, boxplot, Pareto charts), inferential methods (control charts); source of variability, sampling frequence, sample size; typical patterns of control charts.

Statistical Process Control and Control Charts (CC): CC for the mean and the standard deviation; variable sample size is allowed; CC for the mean and the range; CC for single measures; CC for attributes. Process capability indexes.

Prerequisites

A secondary course in Probability and Statistics.

Teaching methods

The course includes the presentation of all the contents through asynchronous videotaped lessons. In addition, there will be a synchronous weekly video conference, in which the topics presented during the week will be explored.

Assessment methods

The exam consists of presenting a paper concerning a statistical analysis on real company-derived data, using QC tools. Possibly, the data will be chosen and retrieved by the student. This paper will include the use of both graphical and inferential tools, and will aim to measure the student's ability to apply the concepts and techniques of QC for the solution of practical problems.

Textbooks and Reading Materials

Douglas C. Montgomery: *“Controllo statistico della qualità”*; Ed. McGraw-Hill.

In addition, lecture notes by the teacher are available in the teaching materials

Semester

First semester.

Teaching language

Italian