NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF ECONOMICS AND STATISTICAL ENGINEERING

STATISTICAL ENGINEERING PROGRAM

ES613 – NON PARAMETRIC STATISTICAL INFERENCE

I. GENERAL INFORMATION

CODE	: ES613 Non parametric statistical inference
SEMESTER	: 6
CREDITS	: 3
HOURS PER WEEK	: 5 (Theory – Practice)
PREREQUISITES	: ES511
CONDITION	: Mandatory

II. COURSE DESCRIPTION

The Non-Parametric techniques constitute a very extensive and useful set of statistical tools that, without assuming basic information about the starting distribution, allow for hypothesis and estimation contrasts.

The present course will develop students' skills in the management of criteria that allow them to properly identify the cases in which it is required to use one of the different Non-Parametric Methods and based on them to make decisions. It will also handle the main statistical techniques to analyze categorical data.

III. COURSE OUTCOMES

At the end of the course the student:

1. Writes the statistical hypotheses correctly.

2. Appropriately chooses the non-parametric statistical technique to analyze free-distribution data.

3. Processes and interprets the results and formulates conclusions taking into account the statistical significance.

4. Selects and internalizes the basic concepts and nonparametric statistical techniques to be used in situations of uncertainty, developing its reasoning and analysis capacity.

IV. LEARNING UNITS

ORDER STATISTICS / 10 HOURS.

Joint distribution of order statistics / Marginal distributions of order statistics / Distribution of the median and rank / Exact moments of order statistics / Confidence Intervals for Quantiles populations.

TESTS FOR ONE SAMPLE / 10 HOURS.
Zocorov-Smirnow / Position Figures: Signal Test / Position Figures: Wilcoxon of the rank with sign / Applications.

TESTS FOR TWO RELATED SAMPLES / 10 HOURS
Dot of Wilcoxon Sign / Test of Mc. Nemar / Applications

TEST FOR TWO INDEPENDENT SAMPLES / 10 HOURS
Fisher's Test / Median Test / Mann-Whitney Test / Kolgomorow-Smirnow Tets / Applications

TESTS FOR K RELATED AND INDEPENDENT SAMPLES / 10 HOURS
Test of Q Cochran / Test by Friedman / Test of Chi-Square / Test by Kruskal-Wallis Ranges / Applications.

ASSOCIACION TESTS / 6 HOURS
Contingency Coefficients C / Coefficients of Correlation of Sperman Ranks / Applications.

V. METHODOLOGY

The course development is based on exhibitions supported by slides, as well as practical examples that illustrate the application of Non-Parametric Statistical Techniques contained in the course. The interrelation between them is revealed.

Problem solving in workshops-practical related to the Non-Parametric Techniques, interpretation of the hypothesis tests corresponding to the decision-making.

At the beginning of each session an introduction will be made to the topics to be reviewed during the day, relating them to the topics previously studied. At the end of each class will indicate where the next sessions will be oriented, and how these contents relate to the knowledge already acquired.

VI. GRADING FORMULA

Evaluation System "G".
Calculation of Final Average: PF = (PP + EP + EF) / 3
PP: Average Practice EP: Partial Exam EF: Final Exam

VII. BIBLIOGRAPHY

1. SIEGELS, SIDNEY, Non-Parametric Statistics. Trillas 1991.
2. Wayne W. Daniel, Applied Nonparametric Statistics. Second edition – 2000.