CoPGr CURRICULAR CHAMBER
SUBJECTS PRESENTATION FORM

SUBJECT'S ACRONYM: **RNP5755**

SUBJECT'S NAME: Topics in Scientific Methodology and Applied Statistics

CURRICULUM/AREA: Neurology/17140

FOCAL AREA: Neurology

INITIAL VALIDITY (Year/Semester):

N. OF CREDITS: 04

Theoretical Classes: 05 Practical Classes, Seminars and Others: 02 Hours of Study: 03
DURATION IN WEEKS: 06

PROFESSOR(S) IN CHARGE:

USP Professor, n. 1076212 – João Pereira Leite
External Professor, n. USP 3012322 – Tonicarlo Rodrigues Velasco

ACTUAL COSTS OF THE SUBJECT: BRL

(Presenting, if applicable, the budget foreseen for the year, as an attachment)

PROGRAM

OBJECTIVES:

Presenting the scientific methodology principles as well as the statistics elements in an applied way having as didactic support a statistic program (granted by the University through covenants) and a data spreadsheet which will be used along the course. The descriptive and inferential statistic concepts, types of variables, normal distribution, hypothesis tests, will be approached during the course. The main tests for analysis of parametric and non-parametric data, parametric and non-parametric correlation and analysis of variance and regression will also be presented. Concepts of multivariate analysis and sampling techniques will also be introduced.

JUSTIFICATION:

In the last 15 years the large amount of personal computers, along with the profusion of excellent statistics softwares, have enabled a radical reformulation on the practice of the statistic teaching in the context of the scientific investigation. In the past, these courses were traditionally given with calculators and spreadsheets, once there was no possibility of employing friendly softwares and the test application itself involved a considered calculation effort. In consequence, a significant amount of the didactic charge was assigned to the teaching of the tests application and performance with the calculations performed by hand. Most of the current statistic programs are considerably easier to use and it has different tests for the most different purposes. In this context, it becomes more important to the student to know the concepts following the statistic theory than the formal performance of the mathematic steps for reaching the result of the statistic test. Thus, this course has the objective of exposing the graduation student in neurology/neurosciences to the basic concepts following the statistic tests. The student will be exposed to the hypotheses tests, normal distribution, tests application for assessing the normality, comparison between independent and paired variables, difference between proportions, Chi-squared test and Fisher's Exact, parametric and non-parametric correlations and regression analysis. During the course, a data spreadsheet containing different types of variables which will serve as supporting material for performing exercises will be used. The students will be taught to use data spreadsheets and their preparation for the analysis. At the end of the course, the student will be able to critically assess the strategies of a hypothetical experimental drawing; to know how to use spreadsheets in descriptive statistics and to prepare the data for statistic analysis.

CONTENT (SYLLABUS):

Content: Statistics' Concepts and Definitions, Statistics Divisions, Variable Definition and Classification, Relation between Variables. Variables Obtainment and Storage (data bank). Descriptive Statistics: Measures of Central Tendency (Mean, Mode and Median), Measures of Variability (Variance, Standard Deviation, Amplitude, Interquartil Interval), List of the Types of Variables with the Descriptive Statistics, Statistics Attainment through Statistic Program. Regular Distribution: Concepts, Applications and Parameters Hypothesis Tests: Concepts, Composition, Type of Error I and II Types. Level of Significance, Steps of the Hypothesis Test, Central Limit Theorem, Statistic Difference x Practical Difference. Normality Verification Tests, Trust Intervals, Z Test for a sample, T Test for a sample, T Test for two independent samples, T Test for paired samples, Performance of tests in the Statistic Program. Test for more than two samples (Variance Analysis – ANOVA), post hoc Tests. Multivariate ANOVA – Two-Way and Reasoning Extension –, Non-Parametric Tests, Mann-Whitney Test, Wilcoxon Test, Kruskal-Wallis Test. Pearson's Correlation Coefficient, Spearman's Correlation Coefficient, Principles of Univariate and Multivariate Regression Analysis, Residues Graph. Tests Performance at the Statistic Program. Test for One Proportion, Test for Two Proportions, Chi-Squared Test, Fisher's Exact Test, McNemar's Test, Sensitivity, Specificity, Predictive Values, Odds Ratio, Tests Performance at the Statistic Program. Sampling: Concepts, Samplings Planning Steps, Types of Sampling, Size of the Sample: Knowledge, a priori, to an average, two averages, more than two averages, one proportion, two proportions Calculation of the Sample Size in the Statistic Program.

EVALUATION METHOD:

The assessment will be made through the performance of the student in the seminars, performance of exercises and test.

NOTES: