STAT 3380 (A01)
An Introduction to Nonparametric Statistics
Winter 2015

Instructor	Dr. Zeny F. Mateo Office: 319 Machray Hall Phone: 474-6707 E-mail: Zeny.Mateo@umanitoba.ca
Office Hours:	Monday/Wednesday from 1:30 pm — 2:30 pm; Tues 1:00 pm – 2:00 pm or by appointment
Course Webpage	Some of the course materials will be posted **on Desire2Learn system through umanitoba/ca/d2l** However, you will still be responsible for any other information given in class.
Textbook	Wayne W. Daniel "Applied Nonparametric Statistics", 2nd Edition, Brooks/ Cole, Duxbury Thomson Learning 1990 ISBN 0-534-38194-4. A **photocopied reprinted version of the textbook** is also available in the bookstore of the University of Manitoba.
Computer Package	The software *JMP* or *SPSS* will be used sometimes in this course to show the solution of some problems.
Marking Scheme	Assignments 15% Midterm Test 35% (1.5 hours, location TBA) Final Exam 50% (2 hours, location TBA)
Reminders on Assignments	There will be five (5) assignments for the whole term. All assignments are due in class before the lectures. All your assignments should be written on 8.5 X11 paper, using one side only and should be properly stapled at the left corner. Answer the questions in the given order. Late assignments will **NOT be accepted.** Messy assignments or those with poor handwriting will be returned with a mark of "0".
Test and Exam	The midterm test is tentatively scheduled **for Friday, March 13, 2015 from 5:00 pm –6:30 pm.** More details will be discussed in class regarding the Midterm Test and Final exams. Please note that there will be no deferred test. So the weight of the Midterm test will be adjusted to the Final exam. Final examination will be scheduled by the University Registrar**.**

Reminders on Test and Exam

Non- programmable calculators are allowed
Formula sheet and statistical tables will be provided if required.

Academic Dishonesty

It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences. Links to resources that that describe academic dishonesty (including plagiarism, cheating, inappropriate collaboration and examination impersonation) can be found at:
http://www.umanitoba.ca/faculties/science/student/webdisciplinedocuments.html

or through the Faculty of Science home page at:
http://www.umanitoba.ca/faculties/science

Typical penalties imposed within the Faculty of Science for academic dishonesty are also described.

Voluntary Withdrawal Date

The voluntary withdrawal date is **March 19, 2015, Thursday** by which time you will have received your marks for the midterm test and probably 3 assignments.

Course Content:

I. Introduction
II Review of Basic Statistics
- (a) Some Important Terminology
- (b) Hypothesis Testing:
  Statistical Significance versus Practical Significance;
  Power of Hypothesis Testis; Efficiency of Hypothesis Tests
- (c) Estimation
- (d) Measurement Scales: Nominal, Ordinal, Interval, and Ratio
- (e) Nonparametric Statistics: History;
  Advantages and Disadvantages; When to Use
  Nonparametric Procedures

III. Procedures that utilize Data from a Single Sample
- (a) Making Inferences about a Location Parameter
  One-Sample Sign Test; Wilcoxon Signed-Ranks Test
- (b) Making Inferences about a Population Proportion
  Binomial Test
- (c) One-Sample Runs Test for Randomness
- (d) Cox-Stuart Test for Trend

IV. Procedures that utilize Data from Two Independent Samples
- (a) Making Inferences about the difference between two location parameters:
  Median Test; Mann-Whitney Test
- (b) Some Miscellaneous Two Sample Tests
  Wald-Wolfowitz Runs Test
  Fisher Exact Test

V. Procedures That Utilize Data from Two Related Samples
- (a) Procedures for Testing Hypotheses about Location Parameters
  Sign Test for Two Related Samples
  Wilcoxon Matched-Pairs Signed-Rank Test
- (b) Confidence Interval Procedures for the Median Difference
- (c) Test for Two Related Samples When Data Consists of Frequencies

VI. Chi-Square Tests of Independence and Homogeneity
- (a) Mathematical Properties of the Chi-square Distribution
- (b) Chi-square Test of Independence
- (c) Chi-square Test of Homogeneity

VII. Rank Correlation and other Measures of Association
- (a) Spearman Rank Correlation Coefficient
- (b) Kendall's Tau
- (c) Kendall's Coefficient of Concordance W

VIII. Procedures that Utilize Data from Three or More Independent Samples
- (a) Extension of the Median Test
- (b) Kruskal-Wallis One-Way Analysis of Variance by Ranks
- (c) Multiple Comparisons

IX. Procedures that Utilize Data from Three or More Related Samples
- (a) Friedman Two-way Analysis of Variance by Ranks
- (b) Multiple- Comparison Procedure for Use with Friedman

X. Optional Topics
- (a) Making Inferences about the Equality of Two Dispersion Parameters
  Ansari-Bradley Test
- (b) Point Biserial Coefficient of Correlation
- (c) Durbin's Test for Incomplete block designs.
- (d) Cochran's Test for Related Observations
- (e) Test for Normality like Lillliefors test, Kolmorov-Smirnov test, Goodness- of-fit Chi-square test