

**DEPAUL UNIVERSITY CDM**  
**IT 403 STATISTICS AND DATA ANALYSIS**  
**SYLLABUS, CLASS SCHEDULE & POLICIES**

**COURSE:** IT 403- Statistics and Data Analysis

**START AND END DATES:** *Contact instructor*

**LOCATION:**

SECTION	In-Class session	<i>Contact instructor</i>
SECTION	Distance learning session	No class room- students view recorded lectures

**INSTRUCTOR:**

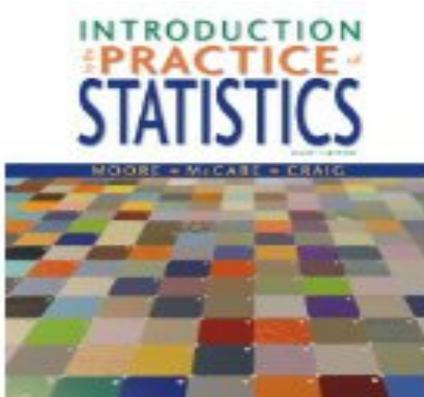
RAY Partha Sarathy Email: [rpartha1@depaul.edu](mailto:rpartha1@depaul.edu) Phone: 312-362-1257 (*no voicemail*)

**Office hours:** *Contact instructor*

Office location: *Contact instructor*

**COURSE MATERIALS:**

**Textbook (Required)\*:** \* Though the 9<sup>th</sup> edition of this textbook was released in December 2016, we will use the 8<sup>th</sup> edition during this term. With the release of the 9<sup>th</sup> edition, the cost of the 8<sup>th</sup> edition has decreased considerably, which should help the students.



**Moore, D.S., McCabe, G.P., & Craig, B. (2014). Introduction to the Practice of Statistics (8th Ed.). W.H. Freeman (McMillan) Publication.**

Mode	ISBN-10	ISBN-13
Print/Paper Book (your bookstore, amazon.com, ebay.com etc.).	1464158932	978-1464158933
Other Options	eBook (Kindle)	
Rent book from chegg.com ( <i>you may also be able to rent from other sources</i> )	<a href="http://www.chegg.com/textbooks/introduction-to-the-practice-of-statistics-8th-edition-9781464158933-1464158932?trackid=43ebde40&amp;strackid=369daaf0&amp;ii=8">http://www.chegg.com/textbooks/introduction-to-the-practice-of-statistics-8th-edition-9781464158933-1464158932?trackid=43ebde40&amp;strackid=369daaf0&amp;ii=8</a>	

***Optional Supplementary Readings/References [you are not required to buy these books, if you choose to buy them, you could buy older editions from e-bay or amazon---no need to buy the latest editions]***

	George, D. & Mallery, P. (2013). IBM SPSS Statistics Step-by-Step	ISBN-13: 978-0205985517
---	---	-------------------------

### **COURSE DESCRIPTION:**

The aim of the course is to teach students statistical methods, data analysis methods, and concepts of probability theory. Some key course topics include descriptive statistics, data visualization with graphs, introduction to statistical inference, and linear regression models. Students will use MS-Excel and the statistical package SPSS for statistical analyses of data sets. *SPSS will be used as a means to an end (to simplify certain statistical calculations), and not as an end in itself (the goal in this course is to teach Statistics, not to teach SPSS).*

**PREREQUISITE COURSES:** None. However, students are expected to understand basic mathematical notations and be familiar with college level arithmetic and algebra concepts. Prior knowledge of Microsoft Excel will be helpful and is preferred. See this link for a good online tutorial: [http://www.wtamu.edu/academic/anns/mps/math/mathlab/col\\_algebra/index.htm](http://www.wtamu.edu/academic/anns/mps/math/mathlab/col_algebra/index.htm). Try googling to find other sources.

### **COURSE OBJECTIVES:**

- To assist the students in developing an understanding of the basic concepts of statistics, data analysis and probability, and their applications.
- To help the students become informed and critical readers of quantitative arguments.
- To provide students sufficient skills to make sense of data.
- To help the students gain an appreciation for the role of statistics in empirical research and scientific study.
- To help the students attain flexible problem-solving skills applicable to unfamiliar statistical settings.

**CALCULATOR (Required):**

Buy an inexpensive non-programmable calculator **WITHOUT** statistical functions (available for less than \$10 at your bookstore, Walmart or other stores). *Though we will use SPSS and Excel to learn how statistical calculations are simplified using computers/software, students will be required to perform calculations using formulae/manual methods in addition to using software. This is imperative to ensure students understand the theory and calculations involved in Statistics/Data Analysis. Also not all statistical analyses can be performed using software alone and there is a manual component of problem solving/decision making invariably involved.*

**COURSE SCHEDULE, TOPICS, AND ACTIVITIES: See next page (schedule shown is tentative)**

**FOR DETAILED COURSE SYLLABUS AND QUESTIONS, PLEASE CONTACT THE INSTRUCTOR (or log into the course home page in D2L).**

## COURSE SCHEDULE, TOPICS, AND ACTIVITIES:

The following course schedule is a tentative schedule. It is subject to changes as needed throughout the term. When changes are made, the updated document will be posted in D2L. It is the students' responsibility to keep track of changes to this schedule by viewing this schedule in D2L every week.

Session	Main Topics
Weeks 1&2	Introductions/Course Overview <u>MODULE 1:</u> Introduction to Statistics and Statistical terminology, Descriptive and Inferential Statistics, Types of data and their treatment, Exploratory data analysis, Use of graphs such as histograms, bar charts, box plots, stem-and-leaf plots to analyze and display data, Statistics for central tendency and spread, Types of variables, Categorical variable, Two way tables and their analysis, Simpson's Paradox, Introduction to distributions and examining distributions, Chebyshev's rule and its application, How to present the findings of data exploration
Week 3	<u>Complete Module 1- Begin Module 2</u> <u>MODULE 2:</u> Density curves, Random variable, Normal distributions and their properties, Normal distribution applications, Testing the Normality assumption, Shapiro-Wilk's test & other tests
Week 4	<u>Complete Module 2- Begin Module 3</u> <u>MODULE 3:</u> Data relationships, Scatter plots, Correlation, Pearson vs Spearman correlation, Coefficient of determination, Correlation vs causation, Lurking variable and confounding variable, Introduction to regression analysis, Simple linear regression/Least squares regression, model fitting, Residuals and residual plots in regression, Treatment of outliers and extrapolations in regression
Week 5	<u>Complete Module 3- Begin Module 4</u> <u>MODULE 4:</u> Probability-Probability models and rules, Random variable and its applications, Statistical estimation, Law of large numbers, Venn diagrams, Tree diagrams, Bayes theorem, Problems involving application of probability
Week 6	<u>Complete Module 4- Begin Module 5</u> <u>MODULE 5:</u> Sampling distribution for averages/means, Central limit theorem, Sampling distributions for counts and proportions, Binomial distribution and Binomial probability, Normal approximation to the Binomial distribution and its applications.
Week 7	<u>Complete Module 5- Begin Module 6</u> <u>MODULE 6:</u> Introduction to statistical inference, Confidence interval and confidence levels, Sample size calculations, P value, Hypothesis testing
Week 8	<u>Complete Module 6- Begin Module 7</u> <u>MODULE 7:</u> Experimental designs, Data types, Surveys, Confounding, Factors and treatments, Comparative experiments, Randomization, Matched pairs, Blocked designs, Principles and types of sampling, Bias and variability
Week 9	<u>Complete Module 7</u> <u>Review for the final exam (based on student requests, certain topics may be repeated)</u>
Week 10,11	Review class/final exam (TBD- contact instructor for details)