NEW YORK CITY COLLEGE OF TECHNOLOGY
The City University of New York

DEPARTMENT: Mathematics
COURSE: MAT 1272
TITLE: Statistics
DESCRIPTION: An introduction to statistical methods and statistical inference. Topics include descriptive statistics, random variables, distributions, sampling estimation and inference, t-tests, Chi-square tests and correlation.
TEXT: Introductory Statistics 9th edition Prem S. Mann John Wiley & Sons

CREDITS: 3
PREREQUISITES: MAT 1190 or MAT 1190CO or higher. Not open to students who have completed MAT 1372 or MAT 2572.

Prepared by: Prof Johanna Ellner, Spring 2021
Updated by: Profs Ezra Halleck and Kate Poirier, Summer 2021

A. Testing Guidelines:

The following examination schedule is suggested.

1. A one-hour exam at the completion of Lessons 1 - 5
2. A one-hour exam at the completion of Lessons 7 - 11
3. A one-hour exam at the completion of Lessons 13 - 18
4. A one-hour exam at the completions of Lessons 20 - 25
5. A one session Final Examination.

B. Requirement: A statistical calculator. Instructions for the TI Graphing Calculator 83 or higher are provided in the textbook.

C. Homework

The on-line homework assignments, as well as the required text, are in Wiley Plus. By the first day of classes instructors should provide students a handout with detailed instructions. The cost is $40 using promotion code CTC06. There is free access for 14 days.

The graded portion of the assignments contain exercises similar to those in the practice problems sets. Students are allowed two attempts at each question for full credit. Further attempts reduce the grade by 30%.
Wiley-Plus provides hints and final solutions.

Learning Outcomes	**General Ed. Learning Outcomes**	**Flexible Core Learning Outcomes**
Define the basic terms and describe the differences between descriptive and inferential statistics.	Think creatively, critically, and develop quantitative and qualitative literacy.	Assess information from a variety of sources and articulate how meanings are created in communications and how experience is interpreted and conveyed.
Organize, construct and interpret tables using quantitative or qualitative data.	Ability to use appropriate graphical methods to draw accurate conclusions.	Interpret and draw inferences and conclusions from representations in graphs and tables using data pertaining to interdisciplinary fields.
Calculate and interpret statistics such as the mean, mode, median, standard deviation, quartiles and percentiles. Identify outliers.	Able to identify the context of a situation in order to select the appropriate representation of data.	Apply statistical analysis in various fields of study.
Use technology given a set of paired data to find the correlation coefficient, the regression line~~s~~ and the predicted y-value given an x-value.	Ability to apply numerical and graphical methods to make appropriate predictions based on the findings.	Use appropriate technology to conduct research and to communicate the results.
Calculate the probability of an~~d~~ events. Explain what a random variable is and be able to do calculations with and provide real life examples modeled by the binomial, hypergeometric and normal distributions.	Apply mathematical methods to make decisions under conditions of uncertainty.	Gain an understanding of how the determination of an event's probability affects us all.
Apply the Central Limit Theorem to find the mean and standard deviation of a sampling distribution as well as its shape. Given an interval in the sampling distribution, determine its probability.	Apply mathematical methods to make decisions under conditions of uncertainty.	Gain an understanding of how the determination of an event's probability affects the population.
Conduct hypothesis testing using the critical value approach with the normal and chi-square distributions.	Be able to connect the concepts of probability to test hypotheses and under the estimated level of significance of each test.	Ability to explain information presented in mathematical forms and make judgements and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis

MAT 1272 Statistics Introductory Statistics by P. Mann 9th edition

REGISTER for the on-line text and WileyPlus using the Course ID _____(provided by instructor).

Lessons	Sections to Read	Homework
Lesson 1	**1.1** Statistics and Types of Statistics **1.2** Basic Terms **1.3** Types of Variables **1.5** Population vs. Sample	**Practice Homework** **1.1:** 1.1, 1.3 **1.2**: 1.5, 1.6 **1.3**: 1.7 , 1.9 **1.5**: 1.13,1.19, 1.21, 1.25 **Graded On-Line HOMEWORK CHAPTER 1**
Lesson 2	**2.1** Organizing and Graphing Qualitative Data **2.2** Organizing and Graphing Quantitative Data (omit subsections: 2.2.5 and 2.2.8)	**Practice Homework** **2.1:** 2.1, 2.5, 2.7 b **2.2**: 2.9, 2.11, 2.17 a - d **Graded On-Line HOMEWORK CHAPTER 2**
Lesson 3	**2.3** Stem-and-Leaf Displays **1.7** Summation Notation using a T1 84 **3.1** Measures of Central Tendency for Ungrouped Data **Learn how to use the calculator to find measures of central tendency**	**Practice Homework** **2.3:** 2.25 , 2.27 **1.7:** 1.37, 1.39 **3.1**: 3.1, 3.9, 3..13 abd, 3.19 **Graded On-Line HOMEWORK CHAPTER 3: # 1 of 2**
Lesson 4	**3.2** Measures of Dispersion for Ungrouped Data (omit coefficient of variance) **Learn how to use the calculator to find standard deviation** **3.4** Use of Standard Deviation only section 3.4.2 **3.5** Measures of Position **3.6** Box-and-Whisker Plot outliers, left and right skews	**Practice Homework** **3.2:** 3.29, 3.35a,c, 3.39a,c, 3.43 **3.4:** 3.59, 3.63 **3.5:** 3.69, 3.73 **3.6**: 3.75, 3.77 AND **Graded On-Line HOMEWORK CHAPTER 3: # 2 of 2**
Lesson 5	**13.1** Simple Linear Regression Model (Omit 13.1.7) **13.4.** Linear Correlation – only calculating ***r*** **13.4.1** **Learn how to use the calculator to find slope and y-int of regression line and the value of r. To find r go to CATALOG scroll down to DIAGNOTIC and turn it ON. (press enter twice)**	**Practice Homework** **13.1:** 13.2, 13,4, 13.11. 13.15, 13.19a,b 13.21all parts **13.4**: 13.45 - 13.53 odd, 13.57a,b, **Graded On-Line HOMEWORK CHAPTER 13**
Lesson 6	**Exam1**	

Lesson 7	**4.1** Experiment, Outcomes and Sample Space **4.2** Calculating Probability	**Practice Homework** **4.1:** 4 .1, 4.3, 4.7 ,4.9 **4.2**: 4.15, 4.17, - 4.21odd, 4.25, 4.27 **Graded On-Line HOMEWORK CHAPTER 4: # 1 of 4**
Lesson 8	**4.3.** Different Probability Concepts **4.3.1** Marginal and Conditional Probabilities and Related **4.3.2** Mutually Exclusive Events **4.3.3** Independent vs. Dependent	**Practice Homework** **4.3**: 4.29 – 4.31 all, 4.33 a, b, 4.35 **Graded On-Line HOMEWORK CHAPTER 4: # 2 of 4**
Lesson 9	**4.3. 4** Complementary Events **4.4.** Intersection of Events and the Multiplication Rule	**Practice Homework** **4.3:** 4.32, 4.33 (c), 4.39 b , 4.41 **4.4**: 4.43, 4.45 a, b, c, 4.49 (a), 4.53-4.57 odd, 4.61 **Graded On-Line HOMEWORK CHAPTER 4: # 3 of 4**
Lesson 10	**4.5** Union of Events and the Addition Rule **4.6.** Counting Rule, Factorials, Combinations, and Permutations **Learn how to use the calculator for combinations and permutations (MATH)**	**Practice Homework** **4.5**: 4.67, 4.71 (a), 4.73, 4.75 **4.6:** 4.83, 4.87, 4.91, 4.93 odd **Graded On-Line HOMEWORK CHAPTER 4 # 4 of 4**
Lesson 11	**5.5** The Hypergeometric Probability Distribution **5.1** Random Variables	**Practice Homework** **5.5 :** 5.43, - 5.45 all **5.1**: 5.1 – 5.3 all **Graded On-Line HOMEWORK CHAPTER 5: # 1 of 3**
Lesson 12	**Exam 2**	
Lesson 13	**5.2** Probability Distributions of a Discrete Random Variable **5.3** Mean and Standard Deviation of a Discrete Random Variable **Learn how to use the calculator to find mean and standard deviation* See last page of syllabus**	**Practice Homework** **5.2**: 5.5 - 5.7 all, 5.11 **5.3:** 5.15 - 5.19 odd, 5.23 **Graded On-Line HOMEWORK CHAPTER 5: # 2 of 3**
Lesson 14	**5.4** The Binomial Probability Distribution **Use formulas to find mean and standard deviation** **Learn how to use the binomial probability table on the calculator**	**Practice Homework** **5.4**: 5.27, 5.29, 5.30, 5.33 - 5.37 odd **Graded On-Line HOMEWORK CHAPTER 5: # 3 of 3**

Lesson 15	**6.1** Continuous Probability Distribution and the Normal Probability Distribution **Learn to use the calculator to find area under standard normal curve –back of Chapter 6**	**Practice Homework** **6.1:** 6.1, 6.5 – 6.17 odd **For:** 6.11-6.17 **-draw normal curve and shading the requested area(s).** **Graded On-Line HOMEWORK CHAPTER 6: # 1 of 3**
Lesson 16	**6.2** Standardizing the Normal Distribution **6.3** Applications of the Normal Distribution **Learn to use the calculator with non standard normal distributions.**	**Practice Homework** **6.2:** 6.19 using the formula, and use the calculator for 6.21 – 6.23 odd **6.3**: use the calculator for 6.25 – 6.31 odd **Write answers in a complete sentence.** **Graded On-Line HOMEWORK CHAPTER 6 : # 2 of 3**
Lesson17	**6.4** Determining the of *z* and *x* Values when an Area Under the Normal Curve is Known **Learn to use the calculator to find z-score given the area or percentage.**	**Practice Homework** **6.4:** use the calculator for: 6.37, Hint: use the calculator to find z score and then use the z-score, mean and standard deviation to find x. 6.39 a-d, 6.40 , 6.41 be sure to **write answers in a complete sentence.** **Graded On-Line HOMEWORK CHAPTER 6: # 3 of 3**
Lesson 18	**Exam 3**	
Lesson 19	**7.1** Sampling Distributions, Sampling Error, and Non-sampling Errors **7.2** Mean and Standard Deviation of $\bar{x}$ **7.3** Shape of the Sampling Distribution of $\bar{x}$	**Practice Homework**: **7.1:** 7.1 -7.3 all, 7.4 use the calculator for parts a – c. **7.2**: 7.7, 7.11, 7.14 , 7.15 use the formulas **7.3**: 7.18, **Graded On-Line HOMEWORK CHAPTER 7: # 1 of 2**
Lesson 20	**7.3 (7.3.1)** Continued Central Limit Theorem, and Ex.7-3 & Ex 7-4 **7.4** Applications of the Sampling Distribution of $\bar{x}$	**Practice Homework** **7.3:** 7.23- 7.27 odd **7.4:** 7.31, 7.35, 7.39 **Write answers in a complete sentence.** **Graded On-Line HOMEWORK CHAPTER 7: # 2 of 2**
Lesson 21	**9.1** Hypothesis Tests: An Introduction	**Practice Homework** **9.1**: 9.1 - 9.5 all, 9.7 **Graded On-Line HOMEWORK CHAPTER 9: # 1 of 4**
Lesson 22	**9.2:** Hypothesis Tests about μ : σ Known **Only section 9.2.2** Use critical value approach (Omit 9.21)	**Practice Homework** **9.2:** 9.9, 9.11, 9.12, 9.16, 9.19 (Type 1 error is rejecting a true hypothesis), 9.21, 9.23 **Graded On-Line HOMEWORK CHAPTER 9: # 2 of 4**

Lesson 23	**9.2:** Application using critical value approach	**Practice Homework** **9.2:** 9.25 (b), 9.27 (b), 9.29 (b), 9.31(b) S**how the rejection and non-rejection regions.** **Write answers in a complete sentence.** **Graded On-Line HOMEWORK CHAPTER 9 : # 3 of 4**
Lesson 24	**9.3:** Hypothesis Tests about μ: σ Unknown **Only section 9.3.2** Use critical value approach only (Omit 9.3.1)	**Practice Homework** **9.3**: 9.34. 9.35, 9.38, 9.39, 9.45(a)- only using t-test, 9.45(b), 9.47 use calculator. S**how the rejection and non-rejection regions.** **Write answers in a complete sentence** **Graded On-Line HOMEWORK CHAPTER 9 : # 4 of 4**
Lesson 25	**Exam 4**	
Lesson 26	**11.1** The Chi-Square Distribution **11.2** A Goodness-of-Fit Test	**Practice Homework** **11.1**: 11.1,11.2 11.5a **11.2**: 11.8, 11.9 – 11.15 odd **Graded On-Line HOMEWORK CHAPTER 11**
Lesson 27	**11.3** A Test about Independence or Homogeneity (Optional)	**Practice Homework** **11.3**: 11.21 - 11.25 odd
Lesson 28	Review	TI calculator needed
Lesson 29	Review	TI calculator needed
Lesson 30	**Final Examination**	TI calculator needed