Stat 260 – Spring 2023
Textbook: Essentials of Probability & Statistics for Engineers & Scientists by Walpole, Myers, Myers, & Ye. Introduction to Probability and Statistics, Tim Swartz.
Supplementary Material: See Brightspace; EPS=Essentials of Probability & Statistics by Walpole, Myers, Myers, Ye.

The numbered questions are found in Essentials of Probability & Statistics for Engineers & Scientists by Walpole, Myers, Myers, & Ye. Short solutions can be found in the back of the book.

Extra problems and reading are given in Devore, 7th edition which is on reserve in the library. Here the extra material is given as: Reading (exercises)

NOTE: You are responsible for topics covered in the lectures AND the material listed here.

Set #	Reading / Exercises
1	Course overview Reading: Section 1.1 and 1.2 [EPS 1.1, 1.2]
2	Descriptive statistics, histograms, boxplots Reading: Sections 2.1, 2.2, 2.3, 2.4 [EPS 4.1, 4.2, 4.8] Exercises: 4.3, 4.5, 4.7 (find the variance using the computational formula; check your answer using the statistical functions of your calculator), 4.9
3	Paired data, scatterplots, correlation Reading: Section 2.5 [EPS 4.8, 7.8 $S_{xy} = \sum (x_i - \bar{x})(y_i - \bar{y}); S_{xx} = \sum (x_i - \bar{x})^2$ see notes Brightspace] Exercises: Produce scatterplots and compute the sample correlation using your calculator for the data given in 7.1, 7.3, 7.5. Comment on your findings. [Answers r=.312, .986, .707]
4	Probability and Set Theory Reading: Sections 3.1, 3.2 [EPS 1.4] Exercises: 1.1, 1.3, 1.5, 1.7, 1.9, 1.11, 1.13
5	Probability Reading: Section 3.3 [EPS 1.5, 1.6, 1.7] Exercises: 1.39, 1.41, 1.43, 1.45, 1.47, 1.49, 1.53
6	Reading: Section 3.4 Conditional Probability [EPS 1.8] Exercises: 1.59, 1.61, 1.63, 1.65(a,b), 1.73, 1.75, 1.77, 1.79
7	Independence Reading: Section 3.4.1 (3.5, 3.6 are background and examples) [EPS 1.8] Exercises: 1.67, 1.69, 1.71
8	Discrete random variables Reading: Chapter 4, Section 4.1 [EPS 2.1, 2.2] Exercises: 2.1, 2.3, 2.5, 2.9, 2.11, 2.13, 2.17, 2.27
9 and 10	Expectations and Variance of a discrete random variables Reading: Section 4.2 [EPS discrete parts of 2.5 and 2.6] Exercises: 2.51, 2.53, 2.55, 2.63, 2.65, 2.75, 2.77 (Ignore the reference to Theorem 2.2. Find the variance of X using the computational form shown in class), 2.87, 2.93
11	Binomial distribution Reading: Section 4.3 [EPS 3.1] Exercises: 3.5, 3.7, 3.9, 3.11, 3.17, 3.19, 3.51
12	Poisson distribution Reading: Section 4.4 [EPS 3.5] Exercises: 3.37, 3.41, 3.43, 3.45, 3.47, 3.49, 3.53, 3.55
13 and 14	Continuous distributions, Expectations of continuous distributions Reading: Chapter 5, Section 5.1 [EPS 2.3, continuous parts of 2.5 and 2.6] Exercises: 2.7, 2.15, 2.19, 2.21, 2.23, 2.25, 2.57, 2.59, 2.69, 2.71, 2.73, 2.79, 2.81, 2.83

Set #	Reading / Exercises
15 and 16	Normal distribution Reading: Section 5.2 [EPS 3.7, 3.8, 3.9, 3.10] Exercises: 3.61, 3.63, 3.65, 3.67, 3.69, 3.71, 3.79, 3.81, 3.83, 3.85, 3.87
17	Gamma distribution, exponential distribution Reading: Section 5.3 [EPS 3.11] Exercises: 3.89, 3.91, 3.93, 3.95, 3.97, 3.99
18 and 19	Jointly distributed random variables Reading: The discrete parts of 5.4 [EPS the discrete parts of 2.4] Exercises: 2.29, 2.39, 2.43, 2.67. Also, for the joint probability function in 2.67 confirm numerically that $Cov(X,Y) = 0$.
20	Statistics and their distributions Reading: Section 5.5 [EPS 4.3] Exercises: 4.13, 4.14, 4.19
21	The Central Limit Theorem Reading: Section 5.6 [EPS 4.4] Exercises: 4.17, 4.21, 4.25.
22	Confidence intervals for normal (variance known) and large samples Reading: Section 6.1, 6.1.1 [EPS bottom half of p. 198 – top half of p. 203] Exercises: 5.1, 5.3, 5.5, 5.7 Devore 7ed: Section 7.1 (1, 3, 5, 7)
23	Confidence intervals for normal samples (variance unknown), Student's t distribution Reading: Section 6.1.1 [EPS bottom half of p. 204 – end of 5.5] Exercises: 5.9, 5.11 Devore 7ed: Section 7.2 to page 265 [we use $n \geq 30$ as large] (13), 7.3 (29, 33, 35a, 37a, 39b, 41)
24	Confidence intervals for a Binomial proportion Reading: 6.1.2 [EPS 5.10] Exercises: 5.39, 5.41, 5.43, 5.45, 5.47, 5.49 Devore 7ed: Section 7.2 page 265-267 [we use the simpler formula] (19, 21, 23, 25)
25 and 26	Hypothesis testing Reading: Sections 6.2, 6.3 [EPS 6.1, 6.3, 6.4, 6.8] Exercises: 6.19, 6.21, 6.23, 6.25, 6.29, 6.55 (solution incorrect, this is a two-tailed test), 6.57, 6.59 Devore 7ed: Section 8.1 to page 287 (1, 3,), 8.2 , 8.3, 8.4 [we use the p-value approach of 8.4]()
27	More on Hypothesis testing Reading: Section 6.4 [EPS 6.2] Exercises: 6.1, 6.3, 6.9, 6.15 Devore 7ed: Section 8.1 page 287 -292 (5, 7, 9)
28 and 29	Inference for two samples, large sample and normal cases Reading: Chapter 7, Sections 7.1, 7.2 [EPS 6.5 up to middle of p. 260] Exercises: 5.25, 5.27, 5.29, 5.37, 6.27, 6.31, 6.33, 6.35, 6.39, 6.41
30	Inference for two Binomial samples Reading: Section 7.3 [EPS 5.11, 6.9] Exercises: 5.51, 5.53, , 6.61, 6.63, 6.65

Set #	Reading / Exercises
31	Paired data case Reading: Section 7.4 [EPS middle of p. 260 – end of 6.5] Exercises: 5.33, 5.35, 6.43, 6.45