Introduction to Statistical Methods
MATH 330 (fall 2017)

Section 101

(Monday and Wednesday 16:00–17:50)

INSTRUCTOR

Stanley Max
Lecturer in Mathematics

OFFICE

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OFFICE HOURS

Mondays: 14:30–15:30; Tuesdays: 15:15–16:15; Wednesdays:1 4:30–15:30;
Thursdays: 15:15–16:15

MY WEBSITE

I will sometimes post important and useful information pertaining to the course on my website. (For example, this syllabus is posted there.) To see the correct page, use this URL: www.stanleymax.net, then click on the tab that says "Course material."

COURSE DESCRIPTION

An introductory course for students with mathematics and computing backgrounds emphasizing statistical ideas and techniques. Descriptive statistics, probability, estimation and sampling, hypothesis testing, regression and correlation, and analysis of variance. The statistical package MINITAB is introduced as a computational tool. Prerequisite: MATH 274.

QUIZZES

A few quizzes will take place throughout the semester, and these may or may not be announced beforehand. If you are absent without a university-approved excuse, you will receive a grade of zero for that quiz. If you are absent with a university-approved excuse, you will not receive a grade but you will not be allowed to make up the quiz. The two lowest quiz grades will be dropped

Regarding absences, the university catalog makes this statement:

> "It is policy of the university to excuse the absences of students for the following reasons:
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> • illness or injury when the student is unable to attend class
>
> • religious observance where the nature of the observance prevents the student from attending class
>
> • participation in university activities at the request of university authorities (e.g., Intercollegiate Athletics, Forensics Team, Dance Company, etc.)
>
> • compelling verifiable circumstances beyond the control of the student
>
> Students requesting an excused absence must provide documentation to the instructor two weeks prior to the scheduled absence when known in advance or as soon as possible when not known in advance.

TEXTBOOK

One textbook is required for this course::

- Jay Devore, *Probability and Statistics for Engineering and the Sciences* 9th ed. (Cengage Learning, 2016). You can get this book as an e-book via Direct Access. Unless you opt out, you are automatically enrolled in Direct Access. This costs $97 and that amount will be added to your semester bill. The computer program WebAccess, from which a number of homework problems are assigned, is included if you purchase the textbook using Direct Access. If you do opt out — which you must do by 23:00 on Sunday (September) — and you acquire the textbook by some other means, then you will need to obtain WebAccess directly from Cengage (the publisher of the textbook).

Optionally, you may also purchase the following two items from the University bookstore:

- A physical copy of the textbook in loose-leaf format for $20.
- *Student Solutions Manual* for the textbook, again in loose-leaf format for $20. This is useful because it shows the solution to odd-numbered problems in greater detail than the textbook itself does.

TESTS, MINITAB ASSIGNMENTS, AND ONLINE HOMEWORK

Other components of the course include three tests and a final exam, several short computer projects, and online homework assignments. Their contribution to the semester grade is shown below. I will explain in class how to access this program.

REQUIRED CALCULATOR

A graphing calculator is required for this course. I have posted separate instructions as to the make and model of graphing calculator that I recommend on my website.

ATTENDANCE

I will take attendance at the beginning of every class, and I will consider your attendance at the end of the semester when I consider your final grade. No matter the reason for an absence, **students remain responsible for all instructional activity conducted in each class.**

ACADEMIC INTEGRITY

This class is conducted in accordance with the Towson University Code of Conduct as described in the TU Catalog or accessed at the following website:

https://www.towson.edu/studentaffairs/policies/documents/code_of_student_conduct.pdf

This code prohibits all forms of dishonesty including cheating and plagiarism. Plagiarism is copying the words of another or using the ideas of another without proper citation. Cheating or plagiarism in any form is unacceptable and a penalty commensurate with the offense will be applied. The range of penalties includes deduction of points or rejection of the assignment, failure of the course, or a more severe disciplinary action by university authorities.

DIVERSITY

In accordance with the Towson University Strategic Plan, the Fisher College of Science and Mathematics Diversity Action Plan, and the Department of Mathematics Diversity Action Plan, everyone participating in this course is expected to be respectful of each other without regard to race, class, linguistic background, religion, political beliefs, sex, gender identity or expression, sexual orientation, ethnicity, age, veteran status, or physical ability. If you feel these expectations have not been met, please speak with your instructor or the designated diversity liaison.

DISABILITY SUPPORT SERVICES

Towson University is committed to providing equal access to its programs and services for students with disabilities, in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with disabilities Act of 1990. To learn how to arrange for any appropriate accommodations, students with disabilities should visit the Disabilities Support Services (DSS) webpage at this URL:

http://www.towson.edu/dss

If you are a student with disabilities, then you have the responsibility to let me know that you have needs in this area. You will need a memo from DSS authorizing accommodations.

DETERMINATION OF YOUR GRADE

GRADED COMPONENTS (these values could change slightly)	
Test 1	15%
Test 2	15%
Test 3	15%
Final Exam	20%
Homework	15%
Minitab assignments and Quizzes	15%
Attendance	5%

DETERMINATION OF YOUR GRADE

FINAL GRADE CUT-OFFS (where x is your overall score)	
A	$93\% \leq x \leq 100\%$
A-	$90\% \leq x < 93\%$
B+	$87\% \leq x < 90\%$
B	$83\% \leq x < 87\%$
B-	$80\% \leq x < 83\%$
C+	$77\% \leq x < 80\%$
C	$70\% \leq x < 77\%$
D+	$66\% \leq x < 70\%$
D	$60\% \leq x < 66\%$
F	$0\% \leq x < 60\%$

SCHEDULE OF TOPICS

The rest of the syllabus contains a detailed list of the textbook sections that we will go over in class, as well as exam dates and the sections with which the exams will deal. The precise scheduling of topics could vary a bit as the semester proceeds, but the dates of the tests are fixed.

Week 1 (August 28 – September 01)	
Lecture Syllabus and course outline. *Section 1.1:* "Populations, Samples, and Processes" (pp. 3–12) *Section 1.2:* "Pictorial and Tabular Methods in Descriptive Statistics" (pp. 13–29) *Section 1.3:* "Measures of Location" (pp. 29–36) *Section 1.4:* "Measures of Variability" (pp. 36–44)	

September 06
Change-of-schedule period ends **Last day to drop a course with no grade posted to academic record** **Last day to add a course**

Week 2 (September 04 – September 08)	
Lecture	
Section 2.1: "Sample Spaces and Events" (pp. 53–57) *Section 2.2:* "Axioms, Interpretations, and Properties of Probability" (pp. 64–66) *Section 2.3:* "Counting Techniques" (pp. 66–75) *Section 2.4:* "Conditional Probability" [but omit Bayes Theorem] (pp. 75–85) *Section 2.5:* "Independence" (pp. 85–91)	

Week 3 (September 11 – September 15)	
Lecture	**WebAssign homework #1 due**
Section 3.1: "Random Variables" (pp. 96–99) *Section 3.2:* "Probability Distributions for Discrete Random Variables" (pp. 99–109) *Section 3.3:* "Expected Values" (pp. 109–117)	September 13 at 15:45.

Week 4 (September 18 – September 22)	
Lecture	**Test 1**
Section 3.4: "The Binomial Probability Distribution" (pp. 117–125)	September 18. This test covers Sections 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, and 2.5.

Week 5 (September 25 – September 29)	
Lecture	**WebAssign homework #2 due**
Section 4.1: "Probability Density Functions" (pp. 142–147) *Section 4.2:* "Cumulative Distribution Functions and Expected Values" (pp. 147–156) *Section 4.3:* "The Normal Distribution" (pp. 156–170) *Section 4.6:* "Probability Plots" (pp. 184–193)	September 27 at 15:45

Week 6 (October 02 – October 06)	
Lecture	**WebAssign homework #3 due**
Section 5.3: "Statistics and Their Distributions" (pp. 220–230) *Section 5.4:* "The Distribution of the Sample Mean" (pp. 230–238) *Section 5.5:* "The Distribution of a Linear Combination" (pp. 238–243)	October 04 at 15:45

Week 7 (October 09 – October 13)	
Lecture	**WebAssign homework #4 due**
Section 6.1: "Some General Concepts of Point Estimation" (pp. 247–264) *Section 7.1:* "Basic Properties of Confidence Intervals" (pp. 277–285) *Section 7.2:* "Large-Sample Confidence Intervals for a Population Mean and Proportion" (pp. 285–294) *Section 7.3:* "Intervals Based on a Normal Population Distribution" (pp. 295–304)	October 11 at 15:45

Week 8 (October 16 – October 20)	
Lecture	**Test 2**
Section 8.1: "Hypotheses and Test Procedures" (pp. 310–326) *Section 8.2:* "z Tests for Hypotheses about a Population Mean" (pp. 326–334) *Section 8.3:* "The One-Sample *t* Test" (pp. 335–346) *Section 8.4:* "Tests Concerning a Population proportion" (pp. 346–352) *Section 8.5:* "Further Aspects of Hypothesis Testing" (pp. 352–356)	October 18. This test covers Sections 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.6, 5.3, 5.4, and 5.5.

Week 9 (October 23 – October 27)	
Lecture	**WebAssign homework #5**
Section 9.1: "*z* Tests and Confidence Intervals for a Difference between Two Population Means" (pp. 362–373) *Section 9.2:* "The Two-Sample *t* Test and Confidence Interval" (pp. 374–382)	October 25 at 15:45

Week 10 (October 30 – November 03)	
Lecture	**WebAssign homework #6 due**
Section 9.3: "Analysis of Paired Data" (pp. 382–391) *Section 9.4:* "Inferences Concerning a Difference between Population Proportions" (pp. 391–398)	November 01 at 15:45

November 06
Last day to withdraw with a grade of 'W' **Last day to change to pass/fail option or audit options**

Week 11 (November 06 – November 10)	
Lecture	**WebAssign homework #7 due**
Section 10.1: "Single-Factor ANOVA" (pp. 410–420) *Section 10.2:* "Multiple Comparisons in ANOVA" (pp. 420–426) *Section 10.3:* "More on Single-Factor ANOVA" (pp. 426–435)	November 08 at154:45

Week 12 (November 13 – November 17)	
Lecture	**Test 3**
Section 12.1: "The Simple Linear Regression Model" (pp. 488–496) *Section 12.2:* "Estimating Model Parameters" (pp. 496–509)	November 15. This test covers Sections 6.1, 7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 8.4, 8.5, 9.1, 9.2, 9.3, and 9.4.

Week 13 (November 20 – November 21)	
Lecture	
Section 12.3: "Inferences about the Slope Parameter on the Slope Parameter β_1" (pp. 510–519) *Section 12.4:* "Inferences Concerning $\mu_{Y \cdot X^*}$ and the Prediction of Future *Y* Values" (pp. 519–527)	

November 22–24
Thanksgiving Day holiday: No class

Week 14 (November 27 – December 01)	
Lecture	**WebAssign homework #8 due**
Section 12.5: "Correlation" (pp. 527–537) *Section 13.1:* "Assessing Model Adequacy" (pp. 542–550)	November 27 at154:45

Weeks15 and 16 (December 04 – December 11)	
Lecture	
Section 12.5: "Correlation" (pp. 527–537) *Section 13.1:* "Assessing Model Adequacy" (pp. 542–550)	

Final Exam to be held on Wednesday (December 13) 16:00–18:00