**STA 296 –Online**

**Statistical Methods and Motivations: Spring 2020**

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Office Hours: MWF 1:00pm -1:50pm or by appointment (please send me an email requesting when you would like to meet)

Free Tutoring center for STA296: MDS 337 MTWR 2:00pm - 7:00pm

**Textbook:**  Lock, *Statistics: Unlocking the Power of Data*, 2nd ed., 2017. To enhance your learning experience and provide affordable access to the right course material, this course is part of an inclusive access model called First Day™.

The University of Kentuckywill bill you at the discounted price as a course charge for this course.

It is NOT recommended that you Opt-Out, as these materials are required to complete the course**. Your price through First** Day™ **is only $68.00**. You can choose to Opt-Out on the first Day™ of class, but you will be responsible for purchasing your course **materials at the full retail price and access to your materials may be suspended.** The national list price through the publisher is normally $120.00.  First Day™ pricing is the BEST and least expensive option for the required course materials.

You may need to claim your WileyPLUS account on Canvas. Any instructions for setting up your account will be given on Canvas. If you opt Out, your access will be terminated after free access for a grace period of two weeks. At that time, you will be required to purchase and enter a code. Please see “[UK STA 296 First Day Wiley Course Materials](https://uk.instructure.com/courses/1965657/discussion_topics/12337960)” Hand out on Canvas file tab to register for WileyPLUS.

Workbook: Rayens, *Statistics 296* ISBN 978-1-61740-754-3. This can be purchased from the UK Bookstore, or directly from the publisher [Van Griner](http://store.van-griner.com/catalog/statistics).

Calculator: anything with “2-variable statistics” on the package—lots of people tend to have either a TI 83 or TI 84+, but something like a TI 30XII S will work fine.

**Class Time and Location:** Go to MyUK and log into Canvas using your LINK BLUE username and password. You will find our course there. It is very important that you check Canvas several times a week. There will be assignments made and due on each week. So you have to stay alert to what is going on. Expect that you will need to be working early each week of this course to complete it. You need to make sure that the email you read routinely is the email that Canvas has associated with your name.

**Minimum Technology Requirements:** In order to participate in this course, you will need access to a computer with the minimum hardware, software and internet configuration described at this site: <https://www.uky.edu/elearning/technology/technicalrequirements> . In addition, you will need:

• The ability to view pdf files (Adobe Reader is a powerful, free download)

• The ability to view the videos we have posted. These will be posted on Canvas.

• The ability to view videos that we have not posted but rather linked from other sites. This is typically not a problem since you probably already are adept at viewing web-based videos. Just make sure you can get to what we assign.

• An internet service provider (ISP) giving fast enough access to the University of Kentucky Canvas web site (elearning.uky.edu) so that you may view the videos and other materials that may be posted, and can participate in any required virtual group sessions.

The use of Internet Explorer, Firefox or Chrome is recommended for use with Canvas.

If you experience technical difficulties with accessing course materials, the Customer Service Center may be able to assist you. Their hours are 7am – 6pm Monday through Friday. You may reach them at 859-257-1300 or by e-mail at helpdesk@uky.edu. Please also inform the Course Instructor when you are having technical difficulties. However, it is your responsibility to resolve access difficulties as they arise; it is not the responsibility of the Instructor or the Team.

**How will we interact with each other?**

• The Discussions: This is our Discussion Board on Canvas (DBC). It is open to all students in our class. We encourage you to use that Canvas Discussion Board to post general questions! Your Instructional Team will check these Boards several times every day and reply in a timely manner. Other students are strongly encouraged to reply as well. The more help, the better we all do in the course. Participating in this Board is not graded. However, it is a good way to get help from the Team and from your peers. The discussion board is for helping one another, partial answers and explanations are welcomed and encouraged, answers to full exercises or quizzes should not be posted.

• Monitoring: Please do not expect the DBC to be monitored 24/7. That is not reasonable. While we may often have someone monitoring rather late into the evening and very early in the morning, don’t expect that. It is your responsibility to ask the necessary questions on a schedule that allows us reasonable time to answer prior to an assignment being due.

• Email: For questions that you don’t want posted, you can email the instructor and TA. Since there will be a lot of emails coming to the instructor as the main form of communication in this class, we use the following guidelines:

o All emails MUST have the subject “STA 296 Section 201: LastName\_FirstName” and should be emailed to me and TA. This will help us serve you better and greatly reduce the risk of emails getting lost. If you don’t go by these rules the Team may just ignore your email.

o The Team will check e-mail several times a day and, unless there are some special circumstances we will follow the schedule below. The Instructional Team is not required to continue or initiate any email conversations after 5:00 p.m. or before 9:00 a.m.

 E-mails received before 5 pm on a weekday will be responded to that day if there is time.

 E-mails received after 5 pm may not be responded to until the following day.

 E-mails received after 5 pm on Friday will be responded to within 48 hours.

If you have questions about the course content (like if you don't understand how to do a linear regression problem),please post questions on Canvas Discussion Board or send an email to TA and me, please do not send email in Canvas. If you have a technical question about WileyPlus, please try Live chat support: <https://hub.wiley.com/community/support/wileyplus-nextgen>. If you have a technical issue regarding Canvas, send an email to 218HELP@uky.edu.

• Other: For face-to-face, telephone, please contact us to set up a meeting time, Free Tutoring center for STA296: MDS 337 MTWR 2:00pm - 7:00pm.

**Pre-Course Material:**

There is assumed material for this course (book sections 1.1, 2.1 – 2.4). This material is presented in the indicated sections in the schedule portion of the syllabus. There are videos (included with WileyPLUS access) covering each learning goal that are an excellent resource with regard to the pre-material. There is one homework assignment covering this material (due by Wednesday, January 28 th at 11:59 PM). You will have an unlimited number of attempts to complete this assignment ***only***. The pre-material homework assignment will count as part of the homework portion of your grade.

**How is my grade determined?**

|  |  |
| --- | --- |
| WileyPlus Video assignment | 5% |
| WileyPLUS Homework | 15% |
| Quizzes and Lab on canvas | 10% |
| First Two Exams (2 @ 20% each) | 40% |
| Final exam | 25% |
| Project | 5% |
| Total | 100% |

Grading scale: 90 – 100, A; 80 – 89.99, B; 70 – 79.99, C; 60 – 69.99, D; <60, E.

**Homework:**

Homework is viewed and submitted using the WileyPLUS online course software. You may need to claim your WileyPLUS account on Canvas. Any instructions for setting up your account will be given on Canvas (“Welcome to First Day™ “handout is available on Canvas under “Files”). If you have any technical problems with WileyPLUS, (1) use the WileyPLUS browser check to see if you are missing any plugins, (2) clear your cache, and/or (3) try using a different browser. If none of those things work, please try Live chat support: www.wileyplus.com/support. Questions related to the content of the course should be directed to me and TA (Post questions on the DBC if you need help! Be alert! When the deadline passes you cannot work on that homework anymore). Late homework will not be accepted for credit, and one homework grades will be dropped.

**Lecture Activities:**

Lecture Activities will come from Beyond the Numbers assignments from the course workbook and WileyPLUS Video Assignment and Quizzes on Canvas, those will be done throughout the semester. Please watch the content videos (WileyPlus video assignment), study section power point lecture notes and chapter summary (on canvas file tab) before starting the quiz.It is your responsibility to make sure you understand what the correct answers are. Answer keys will be posted after each due date. If you have questions about the grade you receive please look at the answer key first. Post questions on the DBC if you need help! Late quiz will not be accepted for credit, although two quiz grades will be dropped.

**How much work should I expect to be doing?**

All course materials are on-line and it is your responsibility to access material in a timely manner. The announcement will set the tone for the week. In general, you should expect to spend a MINIMUM of 6 hours per week on-line interacting with the course materials.

**What about the exams?** Do I need to arrange for proctors?

All exams will be given in paper similar to quiz problems. You have two options: one is taking the exam on campus and the other one is taking the exam at an approved proctoring center (more information will be posted on Canvas). There is a time limit (50 minutes for the first two exams, and 2 hours for final) and the exam must be taken in one sitting.

If you are planning to take the exam with me, the first two exams are tentatively scheduled as

12:00-12:50 pm on Feb. 14th and March 25th, and the final exam will be Monday, May 4th

From 1:00-3:00pm (locations TBA). I highly encourage you to take the exam on campus since I can be physically present and help you during the tests. If you are planning to take the exam at a proctoring center, the windows are:

• Exam 1 will be available on 2/14/2020 and must be submitted before 9:59PM.

• Exam 2 will be available on 3/25/2020 and must be submitted before 9:59PM.

• Final Exam will be available on 5/4/2020 and must be submitted before 9:59PM.

**So what about late or missed assignments?**

Late work will not be accepted for credit, no exceptions. It is your responsibility to make sure that you access and submit assignments on time. Once the deadline for submission has passed, these assignments will no longer be accessible on Canvas.

**What else do I need to know?**

Distance Learning Library Services

As a Distance Learning student you have access to the Distance Learning Library services at http://www.uky.edu/Libraries/DLLS. This service can provide you access to UK’s circulating collections and can deliver to you manuscripts or books from UKs library or other libraries. The DL Librarian may be reached at 859-257-0500, ext 2171, or 800-828-0439 (option #6) or by mail at dlservice@email.uky.edu. For an interlibrary loan visit: http://www.uky.edu/Libraries/linpage.php?lweb\_id=253&llib\_id=16 .

**Policy on academic accommodations due to disability**

If you have a documented disability that requires academic accommodations, please email me the accommodation form as soon as possible. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257‐2754, email address jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

**Academic Offenses:**

PLAGIARISM and CHEATING are serious academic offenses. The following is an excerpt taken from the "Students Rights and Responsibilities Handbook, University of Kentucky" regarding cheating:

"Cheating is defined by its general usage. It includes, but is not limited to, the wrongful giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade."

The following is an excerpt taken from the "Students Rights and Responsibilities Handbook, University of Kentucky" regarding plagiarism:

"All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work........ If the words of someone else are used, the student MUST put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic."

Charges of an academic offense will be made against any student that cheats or commits plagiarism. Penalties for such an offense will be assessed according to University Regulations regarding Academic Offenses. The most severe penalties include suspension or dismissal from the University.

In addition to the circumstances listed above, the following activities are considered evidence of cheating:

1) Any talking to another student during an examination.

2) Looking at another students work during an examination, or allowing another student to look at your work.

3) Collaborating with another student on an examination and/or submitting an assignment that is similar in wording or sentence construction to the work of another student in the class, even if you acknowledge the participation of the other student. ALL SUBMITTED WORK MUST BE DONE BY YOU ALONE.

**Official Course Description:**

Introduction to principles of statistics with emphasis on conceptual understanding. Students will articulate results of statistical description of sample data (including bivariate), application of probability distributions, confidence interval estimation and hypothesis testing to demonstrate properly contextualized analysis of real-world data.

**Prerequisites:**

MA 113, MA 123, MA 137, or equivalent.

**Student Learning Outcomes:**

After completing this course, the student will be able to:

1. Demonstrate understanding of p-value, margins of error and confidence intervals, formal hypothesis tests through their creation or evaluation.

2. Generate and/or analyze critically quantitative and graphic data summaries in their real-world contexts.

3. Integrate knowledge from huge reservoir of available data and illustrate their comprehension of that knowledge through individual summarization.

**Course Goals:**

A student’s successful completion of this course entails: mastering basic statistical concepts, including those associated with its language, the execution of elementary statistical procedures, and correct interpretation of results. Among the methods are estimation of the mean and proportion, single- and two-sample case; hypothesis testing in the same cases; and uni- and bivariate descriptive analyses of quantitative and qualitative variables. Extra attention will be paid to students’ demonstrating understanding of: margins of error and confidence intervals; formal hypothesis tests, including the notion of the p-value; interpretation of quantitative and graphic data summaries; and critical consumption of vast amounts of available information in society and one’s profession today.

Lecture Schedule (tentative):

|  |  |  |
| --- | --- | --- |
| **Topics** | **Book Sections** |  |
| Pre-Course Material | 1.1, 2.1 – 2.4 |  |
| Sampling from a Population | 1.2 |  |
| Experiments and Observational Studies | 1.3 |  |
| Scatterplots and Correlation | 2.5 |  |
| Linear Regression | 2.6 |  |
| Data Visualization and Multiple Variables (optional) | 2.7 |  |
| Sampling Distributions | 3.1 |  |
| Understanding & Interpreting Confidence Intervals | 3.2 |  |
| Bootstrap Confidence Intervals | 3.3 |  |
| Bootstrap Confidence Intervals Using Percentiles | 3.4 |  |
| **Exam 1 Friday, Feb. 14, 2020** |  |  |
| Intro to Hypothesis Testing | 4.1 |  |
| Measuring Evidence with P-values | 4.2 |  |
| Determining Statistical Significance | 4.3 |  |
| Creating Randomization Distributions | 4.4 |  |
| Confidence Intervals and Hypothesis Tests | 4.5 |  |
| Hypothesis Tests Using Normal Distributions | 5.1 |  |
| Confidence Intervals Using Normal Distributions | 5.2 |  |
| **Exam 2 Wednesday, March 25, 2020** |  |  |
| Inference for a Single Proportion | 6.1 |  |
| Inference for a Single Mean | 6.2 |  |
| Inference for a Difference of Proportions | 6.3 |  |
| Inference for a Difference of Means (Independent Samples) | 6.4 |  |
| Inference for a Difference of Means (Paired Samples) | 6.5 |  |
| Inference for Slope and Correlation (optional) | 7.1/9.1\*\* |  |
| **Final exam Monday, May 4th** |  |  |

# Calendar (tentative):

|  |  |  |
| --- | --- | --- |
| **Week** | **Section** | **Due** |
| January 15 -17 | 1.2 (Sampling Terminology - pop vs. sample, SRS, bias) | **Jan. 17:** Syllabus Quiz |
| January 21 -24 | 1.3 (Experiments & Obs. Studies)  2.5 (Scatterplots/Correlation) | **Jan. 22:** 1.2 Video Assign & 1.2 Quiz  **Jan. 23:** 1.3 Video Assign & 1.3 Quiz , 1.2 HW & 1.3 HW, Lab 1 workbook due |
| January 27 -31 | 2.6 (Regression)  3.1 (Sampling Distributions - General) | **Jan. 28: Pre-HW due,** 2.5 Video Assign & Quiz, 2.5 HW  2.6 Video Assign & Quiz, 2.6 HW  **Jan. 30:** 3.1 Video Assign & Quiz, 3.1 HW, Lab 2 Chapter 2 workbook due |
| February 3-7 | 3.2 (CI general setup, interpretation)  3.3 (Constructing Bootstrap CIs, 95% CI using 2\*SE) | **Feb 4:** 3.2 Video Assign & Quiz  **Feb 6:** 3.3 Video Assign & Quiz, 3.2 HW &3.3 HW |
| February 10-14 | 3.4 (Bootstrap CIs Using Percentiles) | **Feb 11:** 3.4 Video Assign &Quiz,  3.4 HW, Lab 3 Workbook due |
| **February 14** | **Exam 1** |  |
| February 17-21 | 4.1 (HT Intro - setting up hypotheses, statistical significance)  4.2 (P-values from Randomization Distributions) | **Feb 18:** 4.1 Video Assign & Quiz  **Feb 20:** 4.2 Video Assign &Quiz, 4.1HW |
| February 24-28 | 4.3 (Statistical Significance/Conclusions)  4.4 (Issues with Hypothesis Testing) | **Feb 25:** 4.3 Video Assign & Quiz, 4.2 HW  **Feb 27:** 4.4 Video Assign & Quiz, 4.3 HW |
| March 2-6 | 4.5 (Confidence intervals and Hypothesis Tests)  5.1 (Hypothesis Tests Using Normal Distributions) | **March 3:** 4.5 Video Assign & Quiz, 4.4 HW  **March 5:** 5.1 Video Assign & Quiz, 4.5 HW , lab4 Workbook due |
| March 9-13 | 5.2 (Confidence Intervals Using Normal Distributions) | **March 10:** 5.2 Video Assign & Quiz, 5.1 HW  **March 12:** 5.2 HW |
| **March 25** | **Exam 2** |  |
| March 25-27 | 6.1 (Inference for Single Proportion) | **Mar 26:** 6.1 Video Assign & Quiz |
| March 30-April 3 | 6.1 (Inference for Single Proportion)  6.3 (Inference for Two Proportions) | **Mar 30 :** 6.1 HW  **Apr 2 :** 6.3 Video Assign & Quiz |
| April 6-10 | 6.3 (Inference for Two Proportions)  6.2 (Inference for Single Mean) | **Apr 7:** 6.2 Video Assign & Quiz,  6.3 HW  **Apr 9:** 6.2 HW |
| April 13-17 | 6.4 (Inference for Two Means - Independent Samples)  6.5 (Inference for Two Means - Paired Samples) | **Apr 14:** 6.4 Video Assign & Quiz  **Apr 16:** 6.5 Video Assign & Quiz, 6.4 HW |
| April 20-24 | 9.1 (Regression Inference) | **Apr 21:** 6.5 HW  **Apr 23:** 9.1 Video Assign & Quiz |
| April 27-May 1 | Dead Week | **Apr 28:** 9.1 HW |
| **May 4** | **Final Exam** |  |

**Video Assignments:** Taken and submitted through Canvas – Assignments module

**Quizzes:** Completed, and submitted through Canvas – Assignments / Quizzes module

**WileyPLUS HWs:** Taken and submitted through Canvas – Assignments module

**Lab Workbook :** Completed on paper, and submitted through Canvas – Assignments module

\* Unless otherwise indicated, all exam/homework deadlines are at 11:59 PM Eastern Time. These are “no later than” dates – the assignments can certainly be submitted before the specified due dates. These times/dates are absolute – late work will not be accepted for credit, no exceptions. Do not ask us to bend/break these rules.