BANA 3363.07: INTERMEDIATE BUSINESS ANALYSIS

Fall 2017

Instructor:	Dr. Kevin Henning	Time:	M/W 9:30 a.m 10:50 a.m.
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Prerequisites: Completion of BANA 2372 (Business Analysis)

Office Hours: Monday 12:30 p.m. - 2:00 p.m. in Huntsville, Tuesday 4:30 p.m. - 6:00 p.m. at The Woodlands Center, and by appointment.

Textbook: Modern Business Statistics (Custom Instant Access MindTap), 6th edition, by Anderson, Sweeney, Williams, Camm, and Cochran. This is a custom online textbook (or e-book) that will be the source of some background reading, graded homework assignments, and practice problems that will help prepare you for exams.

You can purchase access to the e-book either through the campus bookstore (ISBN: 9781285149028) or through a link in Blackboard that will be available on the first day of class. Purchasing through the Blackboard link will likely be cheaper, and has the added benefit of giving you a two-week free trial. You can purchase the custom loose-leaf printed version of the book through the campus bookstore or online at Cengage.com (ISBN: 9781337702263). Purchasing through Cengage will probably be the cheaper option.

Other Materials:

• (Required for attendance and extra credit) We will be using the Top Hat classroom response system this semester. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. If you wish to respond by text message, you will need to have messaging set up on your phone through your carrier and will be responsible for any additional data usage and fees incurred due to using text messaging.

You can visit the Top Hat Overview https://success.tophat.com/s/article/Student-Top-Hat-Overviewand-Getting-Started-Guide within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

An invitation will be sent to you by email, but if dont receive this email, you can register by simply visiting our Top Hat course website https://app.tophat.com/login/523393/?next=/e/523393. Our Course Join Code is: **523393**.

Top Hat requires a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing. A free trial is available for this service as well.

Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team by email (support@tophat.com), through the in-app support button, or by calling 1-888-663-5491.

• A stand-alone calculator for exams that can compute exponents, natural logarithms, and factorials By "stand alone," I mean **not connected in any way** to a cell phone, computer, tablet, or any other device capable of wireless communication or accessing the internet. Any device in the Texas Instruments TI-30 series will work, but there are several other brands that are also acceptable. Graphing calculators, such as the Texas Instruments TI-83 and TI-86 models, are acceptable as well **but** *not* **necessary**. If you have any questions about whether your calculator will be suitable for this course, please let me know **before the day of an exam**.

If I determine that your calculator is unacceptable for exam use, you will either have to borrow a calculator from me—if one is available—or complete the exam without the use of any calculator.

On regular lecture days, we will be performing many calculations as we work through examples. On these days, you can use whatever calculation device you wish, including cell phone apps and laptops. However, for exam days, you must use a "normal" calculator, as described above. I expect you to bring some kind of calculator to every class meeting.

Optional Text:

• Peter H. Westfall and Kevin S. S. Henning, Understanding Advanced Statistical Methods, Chapman Hall/CRC Press, ISBN: 978-1466512108. In this book, my coauthor and I discuss the nature of statistics as the science of modeling the natural world using concepts of randomness and probability. We demonstrate how and why statistical models are the ideal tool for making sense of the "real-world," in the sense that they are able to provide trustworthy estimations and predictions about the world. In addition, we cast a critical light on many commonly accepted statistical practices and highlight some myths and half-truths that have been perpetuated over the years. We go into detail on the behind-the-scenes theory that makes statistics "work" mathematically.

This book is optional; no assignments or any other course work will come from this text.

Course Description and Objectives: Our world is now swimming in exabytes (billions of gigabytes) of data. "Statistics" is the collective term for the processes and procedures by which we analyze and transform data into information that, as fairly as possible, represents the true nature of some aspect of the world. Statistical methods drive discoveries in medicine, genetics, astronomy, neuroscience, psychology, economics, finance, human resources, marketing, and practically every other evidence-based science. In a business setting, statistical methods are used to find new markets, assess quality, make capital investment decisions, forecast sales and costs, and more. In addition, statistical methods have made possible services that could not exist without the ability to extract information and find patterns in data (think of Netflix, eHarmony, Uber, most online advertising, and mobile apps).

This course is a continuation of BANA 2372. This course is designed to introduce students to the use of statistics as a business tool in the face of incomplete knowledge. Topics include estimation and inference of means and proportions using confidence intervals and hypothesis tests, analysis of variance, tests of independence and goodness-of-fit, correlation, and simple and multiple linear regression analysis. Over the course of the semester, attentive students will:

1. Construct and interpret confidence intervals and hypothesis tests for population/process means and proportions

- 2. Use Analysis of Variance (ANOVA) to make inferences about the difference among several population or process means
- 3. Understand and apply the concepts of correlation and regression (simple and multiple) in a business setting

Grading: Your grade will be a weighted average of the items in the following table. I do not use Blackboard's point system! Information about each item appears after the table.

Component	Weight
Three (3) exams	45%
Comprehensive final exam	30%
Blackboard homework assignments	12.5%
Excel online exercises	12.5%

The cutoffs for letter grades are as follows: 90-100-A; 80-89-B; 70-79-C; 60-69-D, 59 and below: F

Exams: There will be three (3) regular exams in addition to a comprehensive final exam. Here are some details:

- Exams will consist of a mixture of questions and problems similar to the assigned Blackboard assignment questions, lecture notes, and practice homework problems. Mathematics, by nature, builds upon itself, so you should expect to use all of the concepts and methods we have discussed previously up to the day of the exam.
- A written review of the topics to be covered on each exam will be sent to you through Blackboard email a few days prior to the exam. There are no in-class reviews. It is your responsibility to go through the review and ask me questions about any topics that are unclear, either in person, email, or through a Blackboard discussion board post.
- I will weight each exam according to your performance on it. The highest exam will be weighted 20%, the second highest will be weighted 15%, and the lowest exam will be weighted 10%.
- Exams must be taken at the day and time listed in the syllabus and/or in class, unless the absence arises from any of the following activities:
 - documented, legitimate school-sponsored or career-related activities (job fairs, work emergencies, school-sponsored sporting events, field trips, etc.)
 - observances of religious holy days (see below)
 - other emergencies (hospitalizations, funerals, child care, major accidents, court dates, jury duty, etc.)

If you miss an exam due to one of these reasons, you must **contact me within two (2)** calendar days of the absence to see what documentation you need to show me to excuse the absence. Acceptable documentation for a medical emergency is a letter from a licensed medical professional on his or her practice or group letterhead explaining why you are unable to take the exam as scheduled. For other emergencies, please speak with me about what forms of documentation I require. Failure to contact me within the above time window will result in a grade of zero (0) on the exam, with no possibility for a make-up. No exams will be dropped for any reason.

Blackboard Homework Assignments: I will assign problems using Blackboard's "Test" feature that are intended to give you practice with the key concepts. Here are some details:

- These assignments are not actual tests. Feel free to consult me, your classmates, tutors, and study partners for help. Be aware, though, that on many problems, the numbers or answer choices will be different for each student. Therefore, simply copying off of another student's assignment will lead to a bad grade. In addition, you will encounter problems like those in the assignments on exams, so you will need to understand how to work all of the problems.
- You will have three (3) opportunities to complete each homework assignment, and I will take the highest grade earned at the end of the semester for each one. For example, if you take Assignment 1 three times and earn a 40 on your first attempt, a 95 on your second, and an 85 on your third, your grade for Assignment 1 will be max(40, 95, 85) = 95 for that assignment when I calculate final grades.
- In the calculation of your final grade, I will drop your single lowest Blackboard assignment grade. Therefore, **no make-ups will be allowed on the assignments.** The missed Blackboard assignment will simply count as the dropped one with no effect on your final grade. Additional missed assignments will count against your final grade.
- Each assignment attempt is independent of the others. Individual questions that you got right or wrong on one attempt have no impact on the grade of any other attempt; that is, you cannot swap correct answers from previous attempts into another attempt to increase your grade. For example, if you get Question 3 correct on your lowest attempt, but incorrect on your highest attempt, you **do not** get credit back for having gotten Question 3 correct on a previous attempt.
- Technical Support Information: As with any online resource, Blackboard doesn't work perfectly all the time. But the problems are usually minor, temporary, and easy to work around. If you encounter any technical problems with submitting an assignment or with any other aspect of course functionality, please do not contact me until you have contacted the SHSU Online Support Desk at 936-294-2780, or blackboard@shsu.edu (otherwise, I will always just tell you to contact them first anyway, so save the time and do so). Hours of operation and other information can be found at online.shsu.edu/campus/support-desk/index.html. Note that SHSU Online does not provide tutoring services and is not responsible for course policies, due dates, organization, or content. Questions regarding these items should be directed to the instructor.

If you are unable to solve the problem with the support technicians, ask them to give you a case/incident number and **then** contact me so that I can verify your issue and, if needed, discuss it with SHSU Online.

Excel online assignments: Most of the calculations involved in statistical analyses in the real world are done using software, with Microsoft Excel being a popular choice in business applications. To enhance the value of the course to your future career, you will complete several Excel assignments corresponding with the major topics of the course. These exercises will be completed online through MindTap (see the textbook information above). **Access to Excel on your personal computer is not required for these exercises.** Rather, you will use a fully functional web-based version of Excel that runs entirely through your browser and works with PC and Mac.

There will be roughly one to three Excel exercises that will follow each Blackboard homework assignment. As with the Blackboard homework assignments, in the calculation of your final grade, I will drop your single lowest Excel online assignment grade. Therefore, **no make-ups will be allowed on the assignments**. The missed Excel assignment will simply count as the dropped one with no effect on your final grade. Additional missed assignments will count against your final grade.

Textbook Problems: Additional practice problems will be assigned through MindTap. **These problems** will not be graded. However, the extra practice you get through doing them will be helpful in studying for the exams.

Communication Expectation: The assignments are designed to give you practice with the basic statistical tools that are used in the real business world. Concepts are more important than calculations, and I expect that at some point, you will need help or guidance. Learning begins with asking questions. **Therefore, I expect you to ask questions!** To ensure that your questions are answered efficiently, if you cannot meet with me in person during office hours, follow the guidelines below:

- If your question **only has to do with you** (such as about your grades, attendance, emergencies, or other personal matters relevant to your performance in the course), email or call me at the address or numbers on page 1 of the syllabus.
- If you have a question **about the content of the course** that would help the class as a whole (such as how to work a problem in a Blackboard assignment or from the textbook, a concept from class you are struggling with, exam format questions, etc.), log into the Blackboard page for this course at blackboard.shsu.edu and **post your question in the discussion board.** You will be able to post questions anonymously if you want. I will answer discussion board questions within 24 hours on weekdays, and within 48 hours on weekends. Therefore, do not wait until the last minute to ask a question.
- When asking for help on a problem, **provide the full text of the problem**. For example, don't simply say "I need help with #12." I won't have any idea what #12 you're talking about. Give me details! Say something like "I need help with Question 12 on Assignment 3," and then provide the **full text** of the question and what specific part you need help with.

Extra Credit: To encourage attendance and active learning, at various times during class I will ask questions that require you to respond using the Top Hat application. You will receive one-half (0.5) point per **correct** answer; **there is no penalty for incorrect answers.** You will accumulate these points over the course of the semester, and **up to** 10 points will be added to each of your exam grades.

The number of points awarded on an exam comes from the total number of points you have earned up to the day before the exam. If you have more than 10 points accumulated by the time of an exam, 10 points will apply to that exam, with the excess points counting toward your points for the next exam if you remain eligible by keeping up your participation rate. For example, if you have earned 15 points by the day of the first exam–and your participation rate is above 75% (see below)–then 10 points will be applied to your Exam 1 grade, with the remaining 5 points counting toward your maximum bonus of 10 points on Exam 2.

DETAILS ON EXTRA CREDIT

- In order to keep your extra credit points, you must maintain a Top Hat participation rate of 75% or higher throughout the course. The participation rate will be checked at the time of each exam. "Participation" means answering a Top Hat question in class, **correctly or incorrectly**. Incorrect responses count toward the participation rate, and correct responses count toward your extra credit. As long as you respond to 75% or more of the questions-right or wrong-you will keep your extra credit points.
- The participation rate is cumulative. It is calculated by dividing the total number of questions you have answered (correctly or incorrectly) from the beginning of the semester up to the day before an exam by the total number of questions asked in that time period. If your participation rate drops below 75% at the time of any exam, you will receive no bonus points on that exam. If you then increase your participation rate to 75% or above by the next exam, any points that you have earned since the previous exam go toward the next exam only. Once points are lost on an exam, they are gone forever.
- It is possible to earn an A in this course without participating in Top Hat. If you choose not to participate in Top Hat, at the end of the semester, I will simply use your raw exam grades when calculating your final course grade.
- The maximum amount of extra credit that can be applied to any exam is ten (10) points.

This all might sound a bit confusing. Let's work through an example. Refer to Table 1 as you read.

- 1. Suppose Bob has exam scores of 80, 75, and 91 on the three regular exams and an 85 on the final exam. Further, suppose that by the time Exam 1 came around, he had answered 8 questions correctly and 2 questions incorrectly, and did not respond at all to 2 questions. Because he responded (correctly or incorrectly) to 10 out of the 12 questions, his participation percentage is $\frac{10}{12} \times 100 = 83.3\%$. This is bigger than 75%, so he gets 8 points added to his Exam 1 score. This is the grade given in the "Grade w/Bonus" column in Table 1.
- 2. Now, suppose that in the days between Exam 1 and Exam 2, Bob got lazy and only answered 6 questions out of the 13 questions asked, getting 5 correct. This lowered his participation percentage to $\frac{10+6}{12+13} \times 100 = 64\%$. Since his participation percentage dropped below 75%, he gets 0 bonus points for Exam 2, and the five points he *could have* applied to Exam 2 are now lost!. His grade for Exam 2 will remain a 75.
- 3. Suppose Bob got his act together and answered all 12 of the questions asked between Exam 2 and Exam 3, getting all 12 correct. Now, his participation percentage is $\frac{10+6+12}{12+13+12} \times 100 = 75.7\%$. His participation percentage went back up above 75%, so he got 10 bonus points (the maximum allowed) for Exam 3, and carried over the remaining 2 points toward the final exam.
- 4. Finally, suppose Bob answered 3 out of the last 4 questions asked before the final exam, getting all 3 correct. His final participation percentage is therefore $\frac{10+6+12+3}{12+13+12+4} \times 100 = 75.6\%$, which is above 75%; therefore, he gets 5 bonus points for the final exam: 3 points for getting the correct answers to the last 4 questions asked **plus the 2 points carried over from Exam 3**.

	Questions						
	Asked	Correct	Unanswered	Bonus	Carryover	Raw Grade	Grade w/Bonus
Exam 1	12	8	2	8	0	80	88
Exam 2	13	5	7	0	0	75	75
Exam 3	12	12	0	10	2	91	101
Final Exam	4	3	1	5	0	85	90

Table 1: Example of how Top Hat bonus points are applied to exams.

Academic Dishonesty: SHSU expects all students to engage in academic pursuits in a manner that is above reproach, and to maintain complete honesty and integrity in academic experiences both in and out of the classroom. The University and its official representatives, acting in accordance with Subsection 5.32 of Academic Policy Statement 810213, may initiate disciplinary proceedings against a student accused of any form of academic dishonesty or cheating. "Cheating" includes, but is not limited to:

- Copying from another student's test paper, laboratory or other report, computer files, data listings, and/or programs;
- Using, during a test, materials not authorized by the instructor, including "homework help" websites, discussion boards, and chat rooms;
- Collaborating, without authorization, with another person during an examination or in preparing academic work;
- Knowingly, and without authorization, using, buying, selling, stealing, transporting, soliciting, copying, or possessing, in whole or in part, the contents of an unadministered test;
- Substituting for another student, permitting any other person, or, otherwise assisting any other person to substitute for oneself or for another student in the taking of an examination or test or the preparation of academic work to be submitted for academic credit, placement, or qualification. For face-to-face classes, this includes signing an attendance sheet for someone else!
- Bribing another person to obtain an unadministered test or information about an unadministered test;
- Purchasing, or otherwise acquiring and submitting as one's own work, any research paper or other writing assignment prepared by an individual or firm.

"Plagiarism" means the appropriation and the unacknowledged incorporation of another's work or idea into one's own work. In other words, if you use another person's words, ideas, or artwork and do not clearly indicate in your paper that you have done so–such as with a reference in a standard citation format–you have committed plagiarism. Penalties for violations of the above policies include, but are not limited to, a significant grade deduction on the assignment, a zero for the assignment, or a failing grade in the course. If I believe that additional disciplinary action is necessary, as in the case of flagrant or repeated violations, the case may be referred to the Dean of Student Life or a designated appointee for further action. If the student involved does not accept my decision, the student may appeal to the chair of the appropriate academic department/school, seeking reversal of the faculty member's decision.

These and other academic policies may be found at shsu.edu/dept/academic-affairs/aps/aps-students.html

Classroom Civility and Cell Phone Policies: (Classroom conduct policies apply to the face-to-face classes only, obviously). I expect everyone to behave in a civil and respectful manner in order to create an atmosphere conducive to teaching and learning. I want everyone in class to have an opportunity to hear the lecture and ask questions. Talking while I am addressing the class or while a classmate is asking a question creates a disruption which hinders the learning process and is therefore not permitted. Even if you are not talking while I am addressing the class, so-called silent activities such as using social media, texting, internet surfing, working on course work from another class, or engaging in any other activity not related our course has the potential to distract students around you. A disruptive student may be asked to leave class and will incur an unexcused absence.

A student who leaves in the middle of class creates a distraction (especially for me). Please take care of personal matters such as restroom and snack breaks before class. If you know before class that you will need to leave early, please let me know sit near the front of the room so that the distraction is minimized. If you must leave before class is over, please collect your belongings and **do not re-enter the classroom**.

STATEMENT ON MOBILE PHONE USE: Any use of a telephone, text messager, or any other device that performs these functions during a test period is prohibited. These devices should not be present during a test or should be stored securely in such a way that they cannot be seen or used by the student. Even the visible presence of such a device during the test period will result in a grade of 0 for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty. ProctorFree (if applicable to your course) will flag your test for review if the system detects that you are using your mobile phone during a test.

This and other academic policies may be found at shsu.edu/dept/academic-affairs/aps/aps-students.html

Attendance Policy: As mentioned in the Extra Credit section above, you will not be directly penalized for absences in this course. However, by not attending class regularly, you risk losing extra credit points you have earned over the course of the semester. Should you lose those points, the grade you earn through your own performance in the course will not be decreased due to poor attendance. You will just not get any "bump."

ADA Accommodations: It is the policy of Sam Houston State University ("University") that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the University. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to

providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the University policy, see https://www.see.shsu.edu/dotAsset/7ff819c3-39f3-491d-b688-db5a330ced92.pdf

Student Observance of Religious Holy Days: Section 51.911 (b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to make up an examination or complete an assignment from which the student is excused within a reasonable time after the absence. "Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20, United States Tax Code.

If you do not inform me of upcoming absences related to this policy, I reserve the right to enforce the standard late work and make-up policies (that is, no late work or make-up work accepted).

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Tentative Course Outline: This is an **approximate** weekly schedule to give you an overview of the course. Exam dates are fixed, however.

Week of	Topics		
8/21	Introduction; review of important BANA 2372 concepts (popula- tions, samples, sample mean, sample variance, random variables)		
8/28	Continue review of BANA 2372 concepts (the normal distribu- tion); sampling distributions and the central limit theorem		
9/4	Confidence intervals; confidence interval for a mean		
9/11	Introduce hypothesis testing; hypothesis testing for one mean		
9/18	Confidence intervals and hypothesis tests for proportions		
9/25	Continue hypothesis tests and confidence intervals for proportions; Exam 1 Wednesday, 9/27		
10/2	Tests and intervals for differences in means (independent samples)		
10/9	Continue tests and intervals for differences in means; matched pairs		
10/16	Intervals and tests for differences in proportions; inference for mul- tiple means (ANOVA)		
10/23	Continue ANOVA; chi-squared goodness-of-fit test		
10/30	chi-squared test of independence; Exam 2 Wednesday, $11/1$		
11/6	Introduce correlation and the simple linear regression model		
11/13	Evaluating the simple linear regression model; inference for regression		
11/20	Introduce multiple linear regression; Exam 3 Wednesday, $11/29$		
11/27	Continue multiple linear regression; wrap up remaining topics		
12/6	Final exam: Wednesday, 12/6, 9:30 a.m 11:30 a.m.		