



E370 - Statistical Analysis For Business and Economics
Indiana University, Department of Economics

Fall 2019, Syllabus
Section 8727

Instructor: Myong Jong(MJ) Shin
Office Location: Wylie Hall (WY) 244
E-mail: myonshin@iu.edu

Class Dates: 08/26/19 – 12/20/19
Class Time: MW 02:30PM – 03:45PM
Class Location: Wylie Hall (WY) 125

Office Hours: MW 01:00PM – 02:15PM¹

GENERAL INFORMATION

Course Description: The overall goal of this course is to introduce you to the discipline of statistics as a science of understanding and analyzing economic data and not as a branch of mathematics. The class is designed to *provide you with the tools* needed to answer real-world questions and better understand the process of scientific research and statistical inference in economics. While a good understanding of these universal statistical tools is its own reward and can find applications in many areas², our course will mostly discuss examples pertaining to economics and business world (you are welcome to think about other applications and consult with me if necessary). Additionally, our focus in this course is *the tools* and not an in-depth analysis of a specific field of economics. Therefore, be ready to see examples from different economic areas (health, education, labor, etc.).

Our journey will start from graphical, tabular and numerical summaries of different types of data and will take us through the topics of probability theory, population and sampling distributions, hypothesis testing, and regression analysis.

¹I am available after the class to shortly discuss anything related to the course. Alternatively, you can visit during my office hours. If the office hours conflict with your schedule, ask for an appointment. You can also contact me via e-mail to ask questions but please realize that I may not be able to respond right away.

²For example, by introducing a variety of ways to summarize data in the large datasets, our course develops data analysis and presentation skills, and teaches you to express ideas in the language broadly understood by the researchers in different areas.

Course Objectives: At the completion of the course, you are expected to be able to:

- Translate between plain English and statistical terminology before applying any statistical tools. In other words, you are expected to be able to identify a key information in the description of the economic problem and write down this information in statistical language/notation (regardless of the wording of the economic situation);
- Select a suitable statistical approach to analyze new situation;
- Represent the data using tables and graphs, and summarize data using a variety of numerical measures;
- Understand (and implement) the process of statistical inference;
- Understand (and perform) basic model building using regression tools;
- Understand the role of underlying assumptions in statistical analyses;
- Use Excel to calculate numerical measures to analyze the data and proficiently read outputs produced by Excel add-ins;
- Interpret quantitative results with various levels of statistical details for the audience (using statistical terminology for the audience familiar with statistics and plain English for those who do not have a special training in statistics).

Prerequisites: E201 (or S201) and M118 (or A118, or X118, or D117, or S118) are required. M119 and E202 are recommended, but not required.

TEXTBOOK AND TECHNOLOGY

Recommended Textbook: Robert A. Donnelly. *Business Statistics*, Pearson. 2^d Edition, 2015 (ISBN-13: 978-0321925121).

Be advised that 3^d edition of the textbook is available for purchase. Textbook material and problems of both 2^d and 3^d editions are very similar. So, either edition will suit our class. Earlier (1st) edition of the textbook suits for studying theoretical concepts of the class. However, examples and practice problems may be significantly different compared to the 2^d edition.

You are free to purchase any version (kindle, ebook, print book) of the textbook you prefer.

Two copies of the textbook are available on reserve in Herman B Wells Library. ‘On reserve’ means that the textbook can be checked out only for 4 hours³. Therefore, this opportunity provides only a limited access to the textbook, but it proved to be useful for many students who study in the library or need a copy of selected topics.

Software: To perform cumbersome calculations, our class will utilize *Microsoft Excel* (Office 2011 or later is recommended). Excel 2016 can be accessed for free through IUB Citrix Cloud (<https://uits.iu.edu/iuanyware>). Alternatively, you can download Microsoft Office through IUB at <https://iuware.iu.edu/>, which includes Excel for your platform.

Computers and Other Devices: The course is designed to use computer software during the class, and the classrooms are equipped accordingly. Lecture slides are posted on Canvas

³Reserve items are listed in IUCAT and may be located using the E370 Coordinator Name (*Nastassia Krukava*), Course Number, or Course Name. On the main IUCAT page, click on the link that says “Reserves” under the Search field.

and include information relevant to these discussions (screenshots, Excel's function descriptions, etc.). Excel files with solutions to the exercises on the lecture slides are also posted on Canvas⁴.

Note: Classroom computers can be used during exams only as instructed. Otherwise, no electronic devices are allowed during the exams except **non-programmable** calculators. Please, make sure that your calculator falls into this category. Simple accounting calculator is the best way to ensure that your device is permitted during the exam. Typically, calculators automatically performing calculations of the mean, variance, regression coefficients, etc. are programmable and cannot be used during the exams. If you are not sure whether your calculator may be used, please ask me about it.

Canvas: The course will use Canvas for posting class announcements, homeworks, grades, exam information, and any additional materials. I will send messages through Canvas when necessary, so please make sure to **read these messages carefully and check Canvas regularly**.

Boost: To stay tuned to the course updates and deadlines, [please consider using Boost app on your mobile devices](#). It aggregates information about your schoolwork and uses it to deliver timely, personalized, automated notifications. This includes sending push notification reminders about upcoming assignment due dates and recently posted course announcements in Canvas. Boost also displays a to-do list of upcoming assignments in your Canvas courses. You can download the Boost app for your mobile device from the Google Play Store or the iOS App Store. When you download and access Boost on a mobile device, you will see all published courses you are enrolled in for the current semester, and can set your notification preferences accordingly. For more information, please see <https://kb.iu.edu/d/atud#app>.

⁴Lecture slides and files with solutions to the exercises may be updated and re-uploaded on Canvas. Any updates will be announced.

COURSE GRADE

Your course grade will be based on the **total score** (out of total 1000 points) you earn for:

- Final Exam (comprehensive, maximum 270 pts);
- Three midterm exams (maximum 174 pts for each exam or 522 pts in total);
- Eight homework assignments (maximum 20 pts for each HW or 160 pts in total). There will be nine homework assignments in total, each worth 20 pts. The lowest homework score will be dropped and eight best scores will be counted towards your final grade;
- Class attendance and participation (maximum 48 pts).

Extra Credit: Occasional extra credit activities are possible. Extra credit points will be added to the total score you earn in the class and, therefore, should be regarded as an opportunity to improve your grade (you should not, however, expect that it will be a significant portion of the grade). The extra credit activities may include extra credit questions on HWs and exams. No make-ups or deadline extensions will be given for these activities.

Grade Scale: The final letter grade for the course will be based on the following scale:

A+	(970 - 1000)	B+	(870 - 899)	C+	(760 - 789)	D+	(620 - 649)	F	(Below 500)
A	(920 - 969)	B	(820 - 869)	C	(680 - 759)	D	(550 - 619)		
A-	(900 - 919)	B-	(790 - 819)	C-	(650 - 679)	D-	(500 - 549)		

I reserve the right to make *advantageous* adjustments of this scale in student's favor. However, you should not rely on a possibility of such adjustment when forming your expectations because curving is neither guaranteed nor is a regular practice in this course.

Scores on the border of the letter grade are decided in student's favor towards the higher letter grade. Please, note that this bumping up rule applies only to **the points** on the border of the letter grade, but not the percentage.

Grade Contests: Except for the final exam, any concerns regarding grades for the exams must be contested **within a week** of posting. The window to address such concerns for the final exam will be announced later (but you should expect it to be shorter than a week). Any concerns regarding grades for the HW assignments must be contested **within a week** after the HW deadline or after the grade is posted (whichever comes the latest). The scores become a permanent part of your record if not contested.

HOMEWORKS AND EXAMS

Homework assignments are constructed to include various types of questions which may as well require short answers and extensive explanations. There may be questions requiring you to analytically/graphically/numerically, with the help of Excel, analyze a problem. So, please, be prepared to use computers for your HWs. Suggested solutions to the HWs and exams will be posted on Canvas shortly after the deadline or the exam day (please, allow some time for posting the answers).

Missed exams and HWs are counted as zero points towards your final grade.

Homeworks: You will be given 9 homework assignments. Completing all assignments is *absolutely necessary* for successful learning of the class material. However, only 8 highest score HWs will be counted towards your final grade. A tentative deadline is set for each homework (see the schedule below) which has to be submitted electronically through Canvas before the deadline. Please note that HWs might not have a fixed day of the week/time for the deadline. Specific date and time depend on our progress in the class and will be announced in class and on Canvas.

There will be a 15 minute buffer added to every due date in case there are network issues while submitting your assignment. If you utilize this buffer but cannot see your grade displayed correctly, please contact me. No HW submissions will be accepted after the buffer time runs out.

Collaboration: Discussion of the HWs with peers is permissible, may be highly beneficial and is encouraged. However, homeworks submitted for the grade should represent your own work. Note that **offering** and **accepting** ready solutions from others is an act of plagiarism, which is a serious offense and **all involved parties will be penalized**.

NO COLLABORATION IS ALLOWED DURING EXAMS!!!

Exam Dates: Exam dates are NOT a subject to change and are indicated below:

Midterm Exam 1	Sep, 25 (W)
Midterm Exam 2	Oct, 23 (W)
Midterm Exam 3	Nov, 20 (W)
Final Exam	Dec, 20 (F), 2:45PM – 4:45PM

Topics covered in the midterms will be specified prior to each exam. The Final Exam is comprehensive and covers all topics discussed in the class.

Please, notice that Final Exam for our class is on Friday of the finals week. This time is determined by the IU Office of the Registrar and is outside of my control. Therefore, [plan your travel at the end of the semester accordingly because no alternative schedule for the final exam will be considered](#).

Make-up Exams and Homeworks: Typically, there will be no make-ups which means that missing an exam/HW will result in zero points for that exam/HW. However, accommodations in the form of a make-up exam will be granted to students who miss the test because of 1) official religious holidays for which the work is not allowed; 2) university-approved activities (more information is provided in the section on policies below); 3) unforeseen medical emergency beyond student control (e.g. long-term hospitalization or concussion) supported

by a proper documentation. Responsibility will rest with the student to inform me *in writing* and **in advance** (at least one week) of the missed exam, so that accommodations can be made. For unforeseen absences, you must inform me in writing no later than *one week* after the exam. If your absence qualifies for a make-up exam, you will be required to coordinate with the instructor for the date and time and complete the make-up exam within *one week* of the original exam date. While the topical coverage of the make-up exam is guaranteed to be the same as for the rest of the class, make-up exam may be given in a different format (e.g, multiple choice questions may be substituted with short answer and open-ended questions). For the make-up exams, you may be asked to use your own laptop if the computer lab accommodation is not feasible..

It is imperative that your schedule permits you to take the final exam. Students who fail to attend the final exam because of catastrophic (and documented) occurrence, which is beyond the student's control and necessitates their absence, and who have a passing grade up to that point should contact me as soon as possible. **Please bring your Indiana University ID to each exam.**

CLASS PREPARATION AND ATTENDANCE

Because the classes are interrelated, you are expected to be familiar with the material of the previous classes. For that, it is useful to go over the notes and read relevant textbook chapters before the class to remind yourself about the basic concepts and terminology. Keep in mind that later parts of the course depend on the earlier parts, and it is considerably easier to keep up than to catch up. So, if you feel confused, ask for the help right away!

Attendance: Attendance is a part of your grade. Therefore, regular attendance is expected. To accommodate unforeseen circumstances, all students receive **four (4) excused absences** throughout the semester to use when needed. Additional excused absences will not be granted. No documentation beyond the four excused absences will be accepted. It is highly recommended that you do not use these four absences frivolously and instead save them in case something beyond your control does occur.

Attendance will be taken in the form of a sign-up sheet that will be in front of the classroom before the lecture starts. You are to leave a checkmark next to your name to indicate that you were present for that lecture. The sheet will be available for upto 5 minutes into class and will be collected afterwards. Any signs of tampering to the sheet, such as signing up for someone else in the class when he/she is not present, will be considered as academic misconduct and the individual(s) will become subject to a disciplinary action as described in the *IU Code of Student Rights, Responsibilities, and Conduct*.

If you have an extended absence due to a situation beyond your control (e.g. long-term hospitalization, concussion), please discuss with me as soon as possible. With documentation, this is the only exception possible to the regular attendance policy.

Late Arrivals: Arriving late to the class (as well as skipping or leaving early) may mean you miss important information about exams, assignments, etc. I cannot guarantee such information will be posted on Canvas, and it is your responsibility to get it from another student. Additionally, arriving late to the class or leaving early does not guarantee that you will be granted attendance points for that date. You must be in class for at least 60 minutes to be considered as being present for the day.

Course Deadlines: You are responsible for changing your status in the course (drop or withdraw) within school established time period. I will not be able to drop the course for you if you miss the deadline. Some important deadlines are listed below and additional information is available at <https://registrar.indiana.edu/official-calendar/official-calendar-fall.shtml>.

Add/Drop Deadline (no W grade)	Sep 1, 2019
Course Withdrawal Deadline (automatic W)	Oct 27, 2019
Complete Session Withdrawal Deadline	Dec 13, 2019

Other Important Dates:

Labor Day	September 2, 2019 (no class)
Thanksgiving Break	November 24 – December 1, 2019 (no classes)

TENTATIVE COURSE SCHEDULE

Week	Topic	Reading	Assignment Due
Week of 08/26	Introduction. Statistics and Data.		
Week of 09/02	Displaying Descriptive Statistics for a Single Variable.	Ch. 2	
Week of 09/09	Calculating Descriptive Statistics, Single Variable and Two Variables.	Ch. 3	HW 1
Week of 09/16	Introduction to Probability. Discrete Probability Distributions (Binomial Distribution).	Ch. 4-5	HW 2
Week of 09/23	Discrete Probability Distributions (Binomial Distribution).	Ch. 5	HW 3; Exam 1 (W)
Week of 09/30	Continuous Probability Distributions (Normal Distribution).	Ch. 6	
Week of 10/07	Sampling and Sampling Distributions.	Ch. 7	HW 4
Week of 10/14	Interval Estimation.	Ch. 8	HW 5
Week of 10/21	Interval Estimation.	Ch. 8	HW 6; Exam 2 (W)
Week of 10/28	Hypothesis Testing, Single Parameter (Mean).	Ch. 9	
Week of 11/04	Hypothesis Testing, Single Parameter (Proportion). Inference About Means with Two Populations.	Ch. 9-10	
Week of 11/11	Inference About Means and Proportions with Two Populations.	Ch. 10	HW 7
Week of 11/18	Introduction to Regression Analysis. Simple Linear Regression.	Ch. 14	HW 8; Exam 3 (W)
Week of 11/25	NO CLASSES (Thanksgiving Break)		
Week of 12/02	Simple Linear Regression.	Ch. 14	
Week of 12/09	Multiple Regression.	Ch. 15	HW9
December, 20 (F) 2:45 PM -4:45 PM	Final Exam		

Note: The schedule can be adjusted as needed except the exam dates. Any changes will be announced.

SOME POLICIES AND CLASS RULES

Phones: Please put your cell phones in the silent mode while in class!

Emails: I reserve a right to not respond or reply with a short "Please, check the Canvas page" to two kinds of emails: 1) asking about where and when my office hours are (this information is provided in multiple places on the course page on Canvas and is really easy to find); 2) asking me to reiterate information from the announcement on Canvas.

Final Exam Policies: You can find IU Final Exam policies at <http://enrollmentbulletin.indiana.edu/pages/finexpol.php> and should appeal to them if you 1) have more than three final exams in one day, 2) have final exams conflicts, 3) missed the final exam.

Disability Accommodations: Accommodations will be made for students registered with Office of Disability Services for Students (DSS). If you need an accommodation for a disability, then it is your responsibility to register with DSS and contact me outside of class to present the written supporting memorandum of accommodation from DSS. Note that requests for accommodations for disability must be received and authorized by your instructor in written form no less than two weeks in advance of need, in order to allow adequate time to review and make appropriate arrangements. No accommodations should be assumed until authorized by your instructor. Additional information can be found at <https://studentaffairs.indiana.edu/disability-services-students/>.

Additionally, starting from this semester, **students will need to request and pick up their Academic Modification Memorandum(Memo) through our online Student Portal** where you can print it out yourselves. The format of the memo will look different and you will have access to it after the first day of undergraduate classes(Monday, August 26, 2019).

Religious Accommodations: Accommodations will be made for students with religious holidays provided that the student notifies me early in the semester (no later than September, 16). Students seeking accommodations for religious observances can find the necessary form, policy statement and calendar of religious holidays at <http://enrollmentbulletin.indiana.edu/pages/relo.php>.

University-Approved Activities: Accommodations will be made for the students who miss the class because of university-approved activities according to IUB Policy for University Approved Curricular and Extracurricular Activities (<https://studentaffairs.indiana.edu/student-support/dean-of-students/attendance.html>). If you are participating in a university-approved activity, please let your instructor know as early in the course as possible so that accommodations can be made (beginning of the semester or at least two weeks in advance of the absence).

Academic Integrity and Ethical Behavior: In addition to skills and knowledge, Indiana University aims to teach you appropriate ethical and professional standards of conduct and inform you of obligations in upholding the highest standards of professional and ethical integrity. You will be able to find extensive information on that in IU Code of Student Rights, Responsibilities, and Conduct (<http://studentcode.iu.edu/>).

In line with these policies, dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession

of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with academic work of other students. Whenever in doubt, ask me about appropriateness of your actions. Students who are found dishonest will receive the most severe academic sanction consistent with IU policies.

SOME Q&A'S

Why is there so much work in this class? First, in E370 each new concept requires a deep understanding of the previously studied ones. Frequent assignments ensure that you master each part of the course at a sufficient level before we move on. Second, statistics is learned by *doing* it. Assignments ask you to *do* statistics, i.e. focus on actually doing it rather than passively reviewing and reading.

Will the solutions to the Excel exercises covered in class be posted on Canvas? Yes. The solutions are available under the *Files* link, folder *Solutions to Excel Problems (Slides)*.

What are the extra practice Excel problems on the slides? We will work on the Excel problems on the lecture slides in the class. However, we will not discuss problems marked 'extra practice'. These are the problems that *you* can use for extra practice when studying for the class. The solutions to these problems are available in the folder *Solutions to Excel Problems (Slides)* on Canvas. So, you can solve these problems on your own and check the solutions.

Do I need to remember all formulas for the exams? No! You will be provided with the formula sheet including the most important formulas covered in the course up to the exam date. The formula sheets are already posted on Canvas (*Files* link, folder *Exams*). Adjustments are possible depending on the class progress towards the exam date.