ECONOMICS 202-01
Statistics
SPRING 2018

Instructor: Xintong Wang Office: 310 Stern Hall Email: wang@hws.edu Office hours: Tuesday, Thursday 13:00-15:00 pm Or by appointment	Lecture meeting time and location: TR 8:45 AM – 10:10 AM Classroom: Stern Hall 301 Term: January 16 – May 1, 2018 Final Exam: Saturday, May 5, 2018 8:30AM-11:30AM Prerequisites: Prerequisite: ECON 160 or 120; MATH 130 strongly recommended.

Note:

All information on this syllabus is subject to change. Any changes to syllabus will be announced via Canvas (in addition to in class). Please make sure that you are receiving notifications via Canvas every day for this course.

Required Texts:

1. *Johnson and Kuby, Elementary Statistics, 11th edition, 2012*

2. Class workbook: I will post them on the Canvas. Please print them out and bring them to the class. And during the class we will complete them and they will be your class notes.

3. External articles, readings, podcasts etc: They will be listed at least a full week ahead of the assigned class time on Canvas. You are expected to read them before coming to the lecture discussions.

Other Resources:

This website has many useful items that may help you learn SAS – the statistical software that we will be learning later in the class:
http://www.ats.ucla.edu/stat/sas/

Why you may want to take this class?

Reason 1- Understanding what a figure in news and studies really suggests to better inform decisions

US Surgeon General's famous report *Smoking and Health* came out in 1964, saying that tobacco smoking increase mortality at a ratio of 1.20, which is statistically significant at 5% level. The tobacco industry then commissioned Darrell Huff, the writer of the book *How to Lie with Statistics*, to testify before Congress and then write another book *How to Lie with Smoking Statistics*, which was positively reviewed by U of Chicago Statistician K.A. Brownlee. Huff said that, what the statistical significance level 5% suggests is that the odds are 19 to 1 that the smoking group truly does have a higher death rate, however, the actual increase from the nonsmoking group may be much less than he 20 percent indicated (or it may be more).

After this class, not only will you understand the jargons floating in the above paragraph, you will also master the knowledge to better understand numbers and inform business and policy decisions.

Reason 2 – Starting point towards more advanced econometrics models

For an economics major, this course lays the foundation for econometrics methods that you use to examine social policy implications and to forecast economic variables such as economy growth, inflation, exchange rates etc.

Reason 3 – Getting your hands dirty with data and starting to conduct empirical research with statistics

In this course, you will go through the process of conducting a semester long economic research. Under the instructions and supports of your professor and teaching assistant, you will propose a good research question and a testable hypothesis using the data set of National Health Interview Survey – the principal source of information on the health of the civilian noninstitutionalized population of the United States. Most importantly, you will choose statistical methods that you learned in class to adequately test the hypothesis.

Learning Outcomes:

Students who successfully complete this course will learn basic statistical concepts and will be able to:

• Produce and interpret tables and graphs.
• Calculate and interpret numerical measures of position (mean, median, mode, percentiles and quartiles) and variability (range, variance, and standard deviation).
• Understand basic probability theory and assign and calculate probabilities.
• Identify discrete and continuous random variables and calculate the expected value and variance of random variables.
• Formulate and test hypotheses using relevant statistical methods and effectively communicate the results to different audiences.
• Critically evaluate newspaper articles which use statistical information.
• Use computer software (Excel, SAS) to analyze and present data.

Communications:

All the class announcements will be made through Canvas. Please check up on it at least once a day.

In emails, please include the name of the class and section in the subject of your email. Please allow one business day for email response. In the unlikely event that the instructor hasn't replied in a business day, you are encouraged to follow up and contact the instructor again.

To increase efficiency and reduce waiting time, you can make an appointment for a 20-minute office hour slot. Feel free to just drop in as well!

Graded Items and Activities:

Problem Sets

There will be a problem set assigned almost each week to keep you use your efforts on a continuous basis. Late work will be accepted for 60% of the possible points up until 3 calendar days when it is due, unless accompanied by an acceptable form of proof of absence (doctor's note, police report, etc.) in which case full credit will be possible. No late homework is accepted after 3 calendar days when it is due. You will

need to turn in a hard copy of the problem set and a scanned version to me via Canvas by the due date. Homework with identical answers will be given no credit and without exception referred to the Committee on Standards.

Exams

There will be two exams. No make-up exams will be given. Material for the exams will come from class lectures, in class assignments and labs, and the text. This subject is by its nature cumulative, and so the exams will assume an understanding of all previously covered material. However, the focus of second exam will be on material covered since the previous exam.

Exams will include written short answer/definition questions, as well as longer problems. The review problems in the textbook are a good guide to the type of problems that will be on the exam, as are in class problems and example problems in textbook chapters. I will give you more information regarding format of exams at appropriate time.

Final Project

Instructions for the final project will be available on Canvas. Each student will do their own data analysis using SAS and write a research paper. There will be three graded portions of the final project. First, a progress report due April 17, the research paper itself, due the last day of class on May 1, and a presentation to the class, to be given during the final exam period.

Lab Assignments

Four times over course of semester, we will devote a class to lab work. You will have some work that will need to be done in class, with help from myself and the teaching assistant as needed. You will need to turn in the lab assignment to me via Canvas and a hard copy by the start of the following class.

Class Participation

a. Pop Quizzes

   We will take (both open-book and closed-book) pop quizzes during the class just to motivate you to stay focused. The content will be drawn from material covered on that day. Each pop quiz will be of 10 points. There will be 8 quizzes total.

b. In Class Cold-call and Volunteer Questions

   We will have in class discussion based on the assigned materials. There will be cold-call questions and volunteer discussion questions. The cold-call questions are done by drawing names from shuffling without replacement (so no backbenchers); the people being called have the option of answering the question on their own, or pass-on the question to another person of their choice; the volunteer questions are open to anyone regardless of whether him/her has been drawn before. Each student has one opportunity to be drawn and each question worth 10 points.

Grading Policies:

Note: You will have to submit final project progress report to receive a "pass" to gain any credits on the final project.

You will receive a percentage grade for each component in Table 2; the weighted average percentage class grade will be calculated based on the weights in the second column of Table 2; then the percentage grade will be converted to the class letter grade in Table 1.

Table 1
Grading Scale

Numeric Score	Letter Grade
97 – 100	A+
93 – 96	A
90 – 92	A -
87 – 89	B +
83 – 86	B
80 – 82	B -
77 – 79	C +
73 – 76	C
70 – 72	C -
67 – 69	D +
63 – 66	D
60 – 62	D -
0 – 59	F

Table 2
Component Weights

Participation	10%
Lab Assignments	20%
Exam 1	20%
Exam 2	20%
Final Project Progress Report	5%
Final Project	25%

Course Policies:

1. The instructor expects students to attend all classes on time. If you miss a class, you are responsible for the material. There is no opportunity to make up in-class work. Attendance is taken at the beginning of each scheduled lecture meeting (so do not be late).

2. Students are expected to come to class on time. Late arrivals are disruptive to the class and disrespectful to me and to your fellow students. **More than five minutes late will count as an absence.**

3. Attendance is a minimum requirement for participation. Students are allowed 3 absences, excused or otherwise, without penalty. After 3 absences any further absences, regardless of reason, will begin to lower participation grade. 5 absences results in zero in participation grade. **More than 8 absences will result in automatic incomplete grade for course.**

4. The instructor's attendance record is the final arbiter of your attendance. It is your responsibility to make sure that you answer the roll each day. There are no excused absences for any reason. If you will need time off for other events or illness or family emergencies, then it is optimal for you to save those three absences for which you will not be penalized.

5. Phones should be turned off upon entering class. It is expected that the computers will only be used for class related work.

6. Students are expected to have completed all class readings before class. There will likely be some things that you may not understand on first reading. It is the purpose of the lecture to help overcome these issues, and to focus on the most important ideas. However, it is not possible for everything in the textbook to be covered in the lecture. You are responsible for all material in the assigned readings.

7. The best way to contact me, other than coming to see me personally, is email. Please include the name of the class in the subject of your email. Please allow 24 hours for response. In the unlikely event that I haven't gotten back to you in 24 hours, you are encouraged to follow up and contact me again.

8. For reasons due to religious observations, it is students' obligation to inform faculty of any necessary accommodation well in advance of the date (2 full weeks minimum) on which special accommodations are needed.

Late Exams and Assignments:

No make-up exams/quizzes will be given. Late work will be accepted for 60% of the possible points up until 3 calendar days when it is due, unless accompanied by an acceptable form of proof of absence (doctor's note, police report, etc.) in which case full credit will be possible. No late homework is accepted after 3 calendar days when it is due.

Academic Honesty Statement:

The instructor (and the Colleges) expects you to conduct yourself with academic honesty and integrity. According to the Handbook of Community Standards:

Giving or receiving assistance during an in-class or take-home examination, quiz, or any other academic exercise, except as specifically authorized by an individual course instructor, violates this principle.

The presentation or reproduction of ideas, words, or statements of another person as one's own, without due acknowledgment, is considered plagiarism and violates this principle. (See the Handbook of Community Standards for more information about what constitutes plagiarism).

Any case of plagiarism will be presented to the Deans' office and the Colleges' Committee on Standards. The instructor reserves the right to fail any student caught cheating or plagiarizing.

You can read HWS's official plagiarism policy here:
http://www.hws.edu/academics/ctl/writes_plagiarism.aspx

Disabilities Syllabus Statement:

Disability Accommodations: If you are a student with a disability for which you may need accommodations, you should self-identify, provide appropriate documentation of your disability, and register for services with Disability Services at the Center for Teaching and Learning (CTL). Disability related accommodations and services generally will not be provided until the registration and documentation process is complete. The guidelines for documenting disabilities can be found at the following website: http://www.hws.edu/academics/ctl/disability_services.aspx

Please direct questions about this process or Disability Services at HWS to Christen Davis, Coordinator of Disability Services, at ctl@hws.edu or x 3351.

Classroom Decorum and Academic Discourse:

The instructor's goal is to create an engaging, motivative and inclusive class environment that promotes learning and growth. I would politely ask you to avoid late arrivals and early departures that disrupt a natural flow of the class. Needless to say that chitchatting, texting, and facebooking during the class do not constitute an act of mutual respect. I would also encourage you actively participate in class discussions, and remain attentive and respectful when your fellow classmates are speaking.

Campus Support Services:

At Hobart and William Smith Colleges, we encourage you to learn collaboratively and to seek the resources that will enable you to succeed. The **Center for Teaching and Learning** (CTL) is one of those resources: CTL programs and staff help you engage with your learning, accomplish the tasks before you, enhance your thinking and skills, and empower you to do your best. Resources at CTL are many: Teaching Fellows provide content support in 12 departments, Study Mentors help you manage your time and responsibilities, Writing Fellows help you think well on paper, Q Fellows support you in courses that require math, and professional staff help you assess academic needs.

The instructor encourages you to explore these and other CTL resources designed to encourage your very best work. You can talk with me about these resources, visit the CTL office on the 2nd floor of the library to discuss options with the staff, or visit the CTL website.

The CTL resource(s) of most use for this class include:

Teaching Fellows
CTL works with the Economics Department to offer one resource that will be essential to your learning in this course, the Economics **Teaching Fellows**. The Teaching Fellows are accomplished Economics majors and minors who are paid to assist other students. They hold regular study hours Sunday—Thursday (I will post this term's hours as soon as they are available).

Q Fellows

The CTL resource that will be most essential in enhancing learning in this course is the **Q Fellows** program. The Q Fellows offer support in courses that require students to use quantitative reasoning, mathematical processing, and symbolic logic to be successful. They are generalists, trained to work with students on the mathematical reasoning necessary to understand the content in a variety of disciplines. The Q Fellows hold drop-in hours and offer support to students around a wide range of mathematical concepts, from Algebra refreshers to learning Calculus II concepts. Students come from many departments including Environmental Studies, Economics, Physics, and Psychology, for a variety of reasons: reviewing basic mathematical concepts, deciphering statistic methods, applications of Calculus and many others.

Study Mentors

The CTL resource especially valuable to students either just starting college OR adjusting to the demands of their choice of Major is the **Study Mentor** program. Study Mentors engage directly with each student in the process of adjusting to new academic demands: they help you find the time you need for both your academic and co-curricular activities, and can help you find strategies to accomplish the tasks in front of you and enhance your reading and study time. Study Mentors may be especially important for those of you who are involved in many activities, work on or off campus, are studying for Teaching Certification, graduate school exams, or prepping for fellowships, or who have one or more unusually demanding courses on your schedule. To meet with a Study Mentor, make an appointment via StudyHub on the CTL website. You can also contact Ingrid Keenan, x3832,keenan@hws.edu, or drop in at the CTL office on the 2nd floor of the library.

Instructor's Recommendation for Success:

1. **Ask question in class and outside of class:** The only stupid question is the one that you don't ask. Also, be attentive and respectful whenever other students ask a question, as in turn you will not be afraid of being judged by the instructor or your classmates to ask a question.

2. **Invest time continuously and keep up with the coursework:** On average, the instructor will expect the students invest in at least 10 hours per week outside of the class to read the material, complete the homework, and prepare for the exam. The statistics is mathematically challenging with materials building upon one another. It is very unlikely that you can swallow all the knowledge in couple of days before the exam take place (and it is not a memorization course).

3. **Read the material before we cover them in class:** We will adopt a fast-paced interactive lecture in class. First because we have a lot of material to cover; secondly because we do not want anyone to feel tedious and to lose engagement in class. Therefore, I will expect you to have already read the material once and come in class with questions on the material. Bringing questions to class will also improve effectiveness in learning and save your total amount of time invested in this class (promote efficiency of time scarcity).

4. **Balance individual work and group work:** Some study tasks are more efficiently done alone without the distraction from other people, such as reading the material, and solving mathematically intense problems. Also, the biggest advantage of working on the homework on your own is to give you feedback on what you know and don't know, and prepare you for tests, where you will also be asked to solve problems on your own. But having a group of friends in class will also give you a chance to help each other with difficult materials, to decrease anxiety, and to form your squad of support inside and outside the class.

5. **Manage stress and anxiety:** Smooth out the time and effort inputs to the class all through the semester. Do some stress reducers everyday such as walking outside, deep breathing, and box

breathing. The best relaxation for knowledge workers are physical work/activities, so working out may be a better stress reducer than watching movies/videos.

6. **Contribute to a respectful, active, and inclusive environment and community of support:** Speak up your ideas and thoughts in class. It would reinforce your learning (even if you got it wrong) and connect you to the people whom you will spend most of the semester with.

7. **Rent a hardcopy textbook, if you are not buying one** Without quoting the actual research, a study (and myself) have found the disruptive effect that scrolling has on comprehension of reading a electronic textbook. It is your preference and choice, but if you are aware that you are more productive and concentrated with printed version, rent a printed version of textbook or purchase a used copy.

Tentative Course Schedule:

Adjustments may be made over the course of the term.

Week	Dates	Reading/Assignments	Topics Covered
1	Jan 16-18	Chapters 1-2	Introduction to Course, What is Statistics? Descriptive Statistics.
2	Jan 23-25	Chapters 2-3 Skip 3.3 Linear Regression	More on Descriptive Statistics, presentation of descriptive statistics, Correlations, and bivariate regression
3	Jan 30-Feb 1	In Class Lab 1	Working with Data, intro to Excel and SAS, Graphs, tables, etc.
		Chapter 4	Probability.
4	Feb 6-8	Chapter 5-6	Probability distributions, discrete random variables, normal distributions.
5	Feb 13-15	In Class Lab 2	Descriptive Statistics in SAS. Correlations in SAS.
		Review/Catch-up	Chapters 1-6.
6	Feb 20-22	Exam 1	Chapters 1-6.
		Chapter 7	Sampling Variability, Sampling distributions
7	Feb 27-Mar 1	Chapter 8 Skip 8.5 – Classical Approach	Inferential statistics, hypothesis testing.
8	Mar 6-Mar 8	Chapter 8 cont'd	
		In Class Lab 3	Hypothesis Testing in SAS. One sample.
9	Mar 13-Mar 15	Chapter 9 Skip 9.3	Hypothesis testing, one population.
10	Spring Break		
11	Mar 27-Mar 29	Chapter 10 Skip 10.5	Hypothesis testing, two populations.
12	Apr 3-Apr 5	Chapter 11 skip part on "Test of Homogeneity"	Hypothesis testing, two populations
		In Class Lab 4	Hypothesis testing in SAS. Two sample. Test of Dependence in SAS, goodness of fit.
13	Apr 10-Apr 12	Review/Catch-up	Chapters 7-11
		Exam 2	Chapters 7-11
14	Apr 17 – Apr 19	Progress Report Due at Start of Class	Final project work in class
15-16	Apr 24-Apr 26, May 1		Final project work in class.
16	Final Exam Period Presentation		Saturday, May 5, 2018 8:30AM-11:30AM