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# MAT 1372-6557 Statistics with Probability (3 cr, 4 hr) Spring 2012

## **Course Meetings:** M, W 10:00 - 11:40 AM (N922) **Email:** ehalleck@citytech.cuny.edu

## **Instructor:** Ezra Halleck **Phone:** (718) 260-5931

## **Office Hours:** M, W 12-1 and by appt **Office:** N726

**Texts:**

1. *Introductory Statistics* 3e by Sheldon Ross
2. *Statistics with Microsoft Excel* 5e by Beverly J. Dretzke

**Computer software:** Course will make considerable use of MS Excel; please bring a USB memory stick to class.

**Course Description:** Topics include sample spaces and probabilities, discrete probability distributions (Binomial, Poisson), expectation and variance, continuous probability distributions (Normal, Student, Chi-Square), confidence intervals, hypothesis testing, and correlation and regression.

**Co/Prerequisite:** MAT1375

**Student Learning Outcomes:** At the end of the semester, students will be able to

1. collect, organize and graph raw data.
2. compute statistical parameters (mean, median, mode, average deviation, variance, and standard deviation).
3. create grouped frequencies distributions, probability distributions, histograms as well as identify bell-shaped distributions (Normal, t-distribution) and non-bell shaped distributions (Chi-square).
4. assign probabilities to events using counting methods, conditional probability and discrete distributions.
5. find the least squares regression line and estimate the correlation
6. determine if the data supports a hypothesis to a given level of significance using known distributions
7. create a contingency table and determine whether the variables are independent
8. use spreadsheet software to assist in creating distributions and testing hypotheses.

**Attendance:** You may miss no more than 3 classes. Lateness between 0 and 40 minutes counts as 1/2 absence. In addition, you will receive no credit for that day’s homework. Once in class, stay for the full period; if you *leave early* without making prior arrangements, *you will be marked as absent*. Students who have been excessively absent and failed the course at the end of the semester will receive either the

* WU grade if they have attended the course at least once. This includes students who stop attending without officially withdrawing from the course.
* WN grade if they have never attended the course.

Every withdrawal (official or unofficial) can affect a student’s financial aid status, because withdrawal from a course will change the number of credits or equated credits that are counted toward financial aid.

**Cell phones:** Please turn *off* and place out of sight. If the instructor sees or hears a phone, he may ask that you hand it to him for the duration of class.

**Academic honesty:** You are encouraged to work in groups on homework, but be able to explain *anything* you turn in. During an exam, showing someone else your work is cheating; you will be treated in the same way as the person who copies. It is your responsibility to cover your work. For the take home exams, you must only ask for help from the learning centers or the instructor. No conferring with classmates, friends, relatives or online homework services is allowed. When asking for help in the learning center, please show the top of the exam, which will explain that tutors should not provide the answers but can only provide hints on how to proceed to the next step if a student is stuck.

**Set enough time aside each week:** You are expected to spend 6 hours outside the classroom each week reading the text, working on projects, doing homework and preparing for exams.

***Time* problems?** Here is a **damage control priority list:**

1. *Read the section prior to the class in which it is covered.* This reading will facilitate your understanding and participation in class. In fact, while the instructor reviews homework and attendance is taken, you will be working on questions from the reading, which will form the basis for group discussion.
2. *Attempt at least some of the homework problems immediately after class,* so that you know how much of the class you understood.
3. *Take advantage of office hours:* If you are unable to attend the scheduled hours, make an appointment.
4. *Make use of the Atrium & Voorhees Learning Centers (approximately 9AM-8PM, M-Th, shorter hours on F & Sat):* While some of the tutors are advanced undergraduate students, many are adjunct faculty.

**Grade components**

**Online participation (5%, 5 points):** You are expected to become members of the openlab, to join the course and to contribute 2 significant and interesting postings by March 10 and 3 additional ones by May 12. You may earn only 1 point in any given week.

**Homework (10%, 72 points possible, scored with 40 points as target):** You received separately a *list of problems*. It is posted on the openlab. The sheet in the math department office and the department’s website is **not the same.** Homework will be checked daily at the beginning of class as part of attendance taking:

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| **points** | **reason for homework grade** |
| 1 | attempted but substantially incomplete |
| 2 | largely complete or complete but not exemplary |
| 3 | complete, work well-organized and easy to read, answers have well-thought, complete sentences. |

**Projects I (10%), II (10%) and III (10%), Presentations for II (5%) and III (5%), (40% total):**

* The instructor will provide a list of suggested topics/sources, but each group of 3 or 4 students is encouraged to find its own topic. Use the daily group discussion time to find members you can work with.
* To ensure an interesting selection of oral presentations, the instructor must personally approve your topics.
* **Project I** (**individual**) involves using and even possibly collecting data and then performing descriptive statistics. The first few classes of the course are devoted to demonstrating precisely what we mean by that. The mean, standard deviation, etc. are found and the data is displayed using histograms, box and whisker plots, pie charts, etc.
* **Project II** (**group**) focuses on data with 2 numerical components, e.g., weight vs. height or hours studied vs. exam score and plotting the data as points on a Cartesian coordinate system to get a **scatter plot**. A line which best fits the data is found and added to the plot. How well the data is clustered around the line is **correlation**.
* **Project III** (**group**) focuses on the t-test and requires the often-elusive concept of hypothesis testing.

**Exam I (10%, take home) and II (10%, in class), (20% total):** A sample exam will be posted on the openlab one week prior to exam II. Anyone who misses exam II with a documented medical or family emergency may arrange to take a makeup exam to be completed 2 class days after returning. The exam will be given outside of the normal class time and an automatic 10 point deduction is applied, e.g., a score of 70 would be lowered to 60. No late submissions for take home. Please scan and send electronically if necessary.

**Final Exam (25%):** Review packets containing sample exam questions will be passed out 2 weeks prior to exam. If you miss final exam and have been failing the course, you will receive an F. Otherwise, if you have a documented illness or emergency, you will have opportunity to take a makeup final exam (small fee).

**Grade scale:**

93 – 100 A 77 – 79.9 C+

90 – 92.9 A- 70 – 76.9 C

87 – 89.9 B+ 60 – 69.9 D

83 – 86.9 B 0 – 59.9 F

80 – 82.9 B-

