



Mathematics
Northeast Campus

Math 1342: Statistics

CRN 55021 – Summer /2015

Classroom 225 / M-F 1-4:20 pm.

3 hour lecture course / 48 hours per semester **3 Weeks**

Textbook: Elementary Statistics:A Step by Step Approach (9th Edition) By Allan Bluman
ISBN- 978-0-07-353498-5

Instructor: Charles Gabi

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Office location and hours: Northline RM:321: MTuWTh 12:30-2pm. By Appointment

Course Description

MATH 1342: Statistics. Topics include histograms, measures of central tendency and variation, probability, binomial and normal distributions, and their applications, confidence intervals, and tests of statistical hypotheses.

Prerequisites

A grade of C or better in Math 0312 or a grade of C or better in MATH 1314 or the equivalent. or an acceptable placement test score.

Course Goal

This course is intended for students primarily in health sciences and business rather than math or science majors. It consists of concepts, ideas, and applications of statistics rather than a theory course.

Course Student Learning Outcomes (SLO):

1. Understand basic concepts and vocabulary for probability and statistics.
2. Organize, analyze, and utilize appropriate methods to draw conclusions based on sample data by using tables, graphs, measures of central tendency, and measures of dispersion.
3. Collect univariate and bivariate data, interpret and communicate the results using statistical analyses such as confidence intervals, hypothesis tests, and regression analysis.
4. Calculate probabilities for binomial and normal probability distributions and find specific values for binomial and normal probabilities.
5. Successfully perform testing of hypotheses using Standard Normal values and t–distribution values.

Learning outcomes

Students will:

- 1.1 Demonstrate knowledge of statistical terms.
- 1.2 Understand the difference between descriptive and inferential statistics.
- 1.3 Identify types of data, measurement level of variables, and four basic sampling techniques.
- 2.1 Construct the relative frequency table from a given set of ungroup data.
- 2.2 Know and use the different graphs: histogram, frequency polygon, Ogives, Pareto, and pie to present data.
- 2.3 Compute the mean, median, mode, midrange, range, variance, and standard deviation.
- 2.4 Identify the various measures of position such as percentiles, deciles, and quartiles.

- 2.5 Find the total number of outcomes in a sequence of events using tree diagram and multiplication rule.
- 3.1 Understand the use of permutation and combination rules.
- 3.2 Determine sample spaces and find the probability of an event using classical probability.
- 3.3 Find the probability of compound events using addition and/or multiplication rules.
- 3.4 Find the conditional probability of an event
- 3.5 Construct a probability distribution for a random variable
- 3.6 Find the mean, variance, and expected value for a probability distribution function.
- 3.7 Find the mean, variance, and standard deviation for binomial distribution.
- 3.8 Identify the properties of the normal distribution.
- 3.9 Find a confidence interval for the mean when s is known or $n > 30$.
- 3.10 Determine the minimum sample size for finding a confidence interval for the mean.
- 3.11 Find a confidence interval for the mean when s is unknown and $n < 30$.
- 3.12 Find a confidence interval for proportion.
- 3.13 Determine the minimum sample size for finding a confidence interval for a proportion.
- 3.14 Find a confidence interval of variance and standard deviation.
- 4.1 Find the exact probability for X successes in n trial of a binomial experiment.
- 4.2 Find the area under the normal curve, given various z values.
- 4.3 Find probabilities for a normally distributed variable by transforming it into a standard normal variable.
- 4.4 Find specific data values for given percentages using the standard normal distribution.
- 4.5 Apply the central limit theorem to solve problems involving sample means.
- 4.6 Use the normal approximation to compute probabilities for a binomial variable.
- 5.1 Understand the definitions used in hypothesis testing.
- 5.2 State null hypothesis and alternative hypothesis.
- 5.3 Understand the terms: type I error and type II error, test criteria, level of significance, test statistic.
- 5.4 Find the critical values for the z -test, t -test, and c -test.
- 5.5 Test hypothesis for means (large and small sample), proportions, variance, and standard deviation.
- 5.6 Draw scatter plot for a set of ordered pairs.
- 5.7 Compute the correlation coefficient and the coefficient of determination.
- 5.8 Compute the equation of the regression line by using the least square method.
- 5.9 Test a distribution for goodness of fit using chi-square.
- 5.10 Test independence and homogeneity using chi-square.
- 5.11 Use the one-way ANOVA technique to determine if there is a significant difference among three or more means.
- 5.12 Determine the difference in means using the Scheffe' or Tukey test if the null hypothesis is rejected in the ANOVA.

Core Objectives

Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.

Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication.

Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

Course Outline: Instructors may find it preferable to cover the course topics in the order listed below. However, the instructor may choose to organize topics in any order, but all material must be covered.

APPROXIMATE TIME	TEXT REFERENCE
Unit I – Introduction to Statistics (3 hours) This unit covers an introduction to statistics, descriptive and inferential statistics, variables and types of data, data collection, sampling techniques, and uses and misuses of statistics. A technology discussion is included.	<i>Sections: 1.1-1.3</i>
Unit 2 – Descriptive Statistics (6 hours) This unit covers data in frequency distributions and tables, graphs of frequency polygons, histograms, ogives, pareto charts, and time series. Topics include measures of central tendency, measures of variation, and measures of position. Included in these topics are the math concepts of mean, median, mode, distribution shapes, range, variance, standard deviation, coefficient of variation, Chebyshev’s theorem, z score, percentiles, deciles, quartiles, and outliers.	<i>Sections: 2.1-2.5</i>
Unit 3 - Probability (6 hours) This unit begins with the introduction to probability as a chance concept. The basic concepts of probability covered are probability experiments, sample spaces, the addition and multiplications rules, and conditional probabilities. Also, counting rules, permutations and combinations are discussed.	<i>Sections: 3.1-3.4</i>
Unit 4 – Discrete Probability Distributions (4.5 hours) This unit gives an introduction to distribution theory and explains the concepts and applications of a probability distribution. Topics include mean and variance of discrete random variables and the binomial distribution.	<i>Sections: 4.1-4.3</i>
Unit 5 – Normal Probability Distributions (4.5 hours) This unit begins with properties of a normal distribution. Topics include the standard normal distribution, application of the normal distribution, the central limit theorem, and normal approximation to the binomial distribution.	<i>Sections: 5.1-5.5.</i>
Unit 6 – Confidence Intervals (6 hours) This unit starts with an introduction to inferential statistics as related to estimation. Topics include confidence intervals for the mean (standard deviation of population known and $n > 30$), sample size, confidence intervals for mean (sigma unknown and $n < 30$), confidence intervals and sample size for proportions, and confidence intervals for variances and standard deviation.	<i>Sections: 6.1-6.4</i>
Unit 7 – Hypothesis Testing	<i>Sections: 7.1-7.5</i>

(6 hours)

This unit begins with an introduction to the concepts involved with statistical hypothesis testing. Topics include steps in hypothesis testing of the z-test for mean and proportion, and the t-test for means using the traditional and p-value methods. A chi-squared test for variance and standard deviation is also included.

Unit 8 - Correlation and Regression

Sections: 9.1-9.3

(4.5 hours)

This unit begins with an introduction to variable relatedness. Topics include scatter plots, correlation, and regression.

Unit 9 - Chi-Square Test and ANOVA

Sections: 10.1-10.4

(4.5 hours)

This unit begins with an introduction to statistical tests for variance and goodness of fit. The unit includes ANOVA with the F distribution and multiple comparison procedures for one-way analysis of variance.

CALENDAR

May 29	Last day for Administrative withdrawal (by 4:30 pm)
May 25	Memorial Holiday
May 26	Test 1 (chapter 1 and 2)
May 29	Test 2 (chapters 3 and 4)
Jun 04	Test 3 (chapters 5 and 6)
Jun 05	Final Exam (Comprehensive to include 7, 9 & 10.)

Instructional Methods

The instructor will strive to facilitate an effective learning environment through lectures, classroom practice activities, discussions, and review sessions.

Student Responsibilities:

To be successful in this class, it is the student's responsibility to complete the following tasks.

- Constantly Check Blackboard for updates..
- Participate in online discussions as needed..
- Read and study the textbook.
- Complete the **Math-Connect** homework and required assignments.
- Work the reviews before taking the tests.
- Take all the tests.
- Pass the Final Exam.
- Keep copies of all paperwork, including this syllabus, handouts, and all homework assignments in a 2 inch binder.

Student Assignments

All homework must be completed online using **Mathlab**. You must have a score of at least 80% on all corresponding homework to take any Test.

Assessments

Your final grade for the course will be evaluated according to the following ratio:

1. **Three Examinations**20% each
2. **Math -Lab Homework**15%
3. **Comprehensive Final** examination 25%.

The Final Course Average = $0.20(E1 + E2 + E3) + 0.15(HW) + 0.25(Final)$

Grading scale

The following scale will be used at the end of the semester to assign a course grade based on the overall course average calculated using the weights above.

- 90-100.....A
- 80-89.....B
- 70-79.....C
- 60-69.....D
- Below 60.....F

HCC Policy Statement - ADA

Services to Students with Disabilities

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at his or her respective college at the beginning of each semester. Faculty members are authorized to provide only the accommodations requested by the Disability Support Services Office. Persons needing accommodations due to a documented disability should contact the ADA counselor for their college as soon as possible. For questions, please contact Donna Price at 713.718.5165. To visit the ADA Web site, please visit www.hccs.edu then click Future students, scroll down the page and click on the words Disability Information.

HCC Policy Statement: Title IX

HCC is committed to provide learning and working environment that is free from discrimination on the basis of sex which includes all forms of sexual misconduct. Title IX of the Education Amendments of 1972 requires that when a complaint is filed, a prompt and thorough investigation is initiated. Complaints may be filed with the HCC Title IX Coordinator available at 713 718-8271 or email at oie@hccs.edu.

HCC Policy Statement: Academic Honesty

A student who is academically dishonest is, by definition, not showing that the coursework has been learned, and that student is claiming an advantage not available to other students. The instructor is responsible for measuring each student's individual achievements and also for ensuring that all students compete on a level playing field. Thus, in our system, the instructor has teaching, grading, and enforcement roles. You are expected to be familiar with the University's Policy on Academic

Honesty, found in the catalog. What that means is: If you are charged with an offense, pleading ignorance of the rules will not help you. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by College System officials against a student accused of scholastic dishonesty. "Scholastic dishonesty": includes, but is not limited to, cheating on a test, plagiarism, and collusion.

Cheating on a test includes:

- Copying from another students' test paper;
- Using materials not authorized by the person giving the test;
- Collaborating with another student during a test without authorization;
- Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of a test not yet administered;
- Bribing another person to obtain a test that is to be administered.

Plagiarism means the appropriation of another's work and the unacknowledged incorporation of that work in one's own written work offered for credit.

Collusion means the unauthorized collaboration with another person in preparing written work offered for credit. Possible punishments for academic dishonesty may include a grade of 0 or F in the particular assignment, failure in the course, and/or recommendation for probation or dismissal from the College System. (See the Student Handbook)

HCC Policy Statements

Class Attendance - It is important that you come to class! Attending class regularly is the best way to succeed in this class. Research has shown that the single most important factor in student success is attendance. Simply put, going to class greatly increases your ability to succeed. You are expected to be on time at the beginning of each class period. For complete information regarding Houston Community College's policies on attendance, please refer to the Student Handbook. You are responsible for materials covered during your absences. Class attendance is checked daily. Although it is your responsibility to drop a course for nonattendance, the instructor has the authority to drop you for excessive absences.

If you are not attending class, you are not learning the information. As the information that is discussed in class is important for your career, **students may be dropped from a course after accumulating absences in excess of six (6) hours of instruction.** The six hours of class time would include any total classes missed or for excessive tardiness or leaving class early.

You may decide NOT to come to class for whatever reason. As an adult making the decision not to attend, you do not have to notify the instructor prior to missing a class. However, if this happens too many times, you may suddenly find that you have "lost" the class.

Poor attendance records tend to correlate with poor grades. If you miss any class, including the first week, you are responsible for all material missed. It is a good idea to find a friend or a buddy in class who would be willing to share class notes or discussion or be able to hand in your work if you unavoidably miss a class

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HCC Course Withdrawal Policy

If you feel that you cannot complete this course, you will need to withdraw from the course prior to the final date of withdrawal. Before, you withdraw from your course; please take the time to meet with the instructor to discuss why you feel it is necessary to do so. The instructor may be able to provide you with suggestions that would enable you to complete the course. Your success is very important. Beginning in fall 2007, the Texas Legislature passed a law limiting first time entering freshmen to no more than **SIX** total course withdrawals **throughout** their educational career in obtaining a certificate and/or degree.

To help students avoid having to drop/withdraw from any class, HCC has instituted an Early Alert process by which your professor *may* “alert” you and HCC counselors that you might fail a class because of excessive absences and/or poor academic performance. It is your responsibility to visit with your professor or a counselor to learn about what, if any, HCC interventions might be available to assist you – online tutoring, child care, financial aid, job placement, etc. – to stay in class and improve your academic performance.

If you plan on withdrawing from your class, you **MUST** contact a HCC counselor or your professor prior to withdrawing (dropping) the class for approval and this must be done **PRIOR** to the withdrawal deadline to receive a “W” on your transcript. ****Final withdrawal deadlines vary each semester and/or depending on class length, please visit the online registration calendars, HCC schedule of classes and catalog, any HCC Registration Office, or any HCC counselor to determine class withdrawal deadlines. *Remember to allow a 24-hour response time when communicating via email and/or telephone with a professor and/or counselor. Do not submit a request to discuss withdrawal options less than a day before the deadline.* If you do not withdraw before the deadline, you will receive the grade that you are making in the class as your final grade. **The last day to withdraw 3/30/2015.****

Repeat Course Fee

The State of Texas encourages students to complete college without having to repeat failed classes. To increase student success, students who repeat the same course more than twice, are required to pay extra tuition. The purpose of this extra tuition fee is to encourage students to pass their courses and to graduate. Effective fall 2006, HCC will charge a higher tuition rate to students registering the third or subsequent time for a course. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading and writing homework, test taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.

Classroom Behavior

Be respectful of the learning environment and others at all times. Disruptive behavior will not be tolerated.

Use of Camera and/or Recording Devices

As a student active in the learning community of this course, it is your responsibility to be respectful of the learning atmosphere in your classroom. To show respect of your fellow students and instructor, you will turn off your phone and other electronic devices, and will not use these devices in the classroom unless you receive permission from the instructor.

Use of recording devices, including camera phones and tape recorders, is prohibited in classrooms, laboratories, faculty offices, and other locations where instruction, tutoring, or testing occurs. Students with disabilities who need to use a recording device as a reasonable accommodation should contact the Office for Students with Disabilities for information regarding reasonable accommodations

Instructor Requirements

I believe student learning should be self-driven. I am here to guide my students and act as a facilitator to advance your subject matter knowledge.

Personal Communication Device Policy:

All personal communication devices (any device with communication capabilities including but not limited to cell phones, blackberries, pagers, cameras, palmtop computers, lap tops, PDA's, radios, headsets, portable fax machines, recorders, organizers, databanks, and electronic dictionaries or translators) must be muted or turned off during class. Such activity during class time is deemed to be disruptive to the academic process. Personal communication devices are to not be on the student desk during examinations. Usage of such devices during exams is expressly prohibited during examinations and will be considered cheating (see academic honesty section above).

Student Course Reinstatement Policy:

Students have a responsibility to arrange payment for their classes when they register, either through cash, credit card, financial aid, or the installment plan. Faculty members have a responsibility to check their class rolls regularly, especially during the early weeks of a term, and reconcile the official class roll to ensure that no one is attending class whose name does not appear on it. Students who are dropped from their courses for nonpayment of tuition and fees who request reinstatement after the official date of record (OE Date) can be reinstated by making payment in full and paying an additional \$75 per course reinstatement fee. A student requesting reinstatement should present the registrar with a completed **Enrollment Authorization Form** with the signature of the instructor, department chair, or dean who should verify that the student has been attending class regularly. Students who are reinstated are responsible for all course policies and procedures, including attendance requirements.

Resources:

Free tutoring is available in **Room 421**. Additional help is also available through **instructor conference by appointment** and through Student Support Services. Students can get free assistance, 24 hours a day, 7 days a week, in Math, English and other subjects, at www.hccs.askonline.net. Typically, posted questions are answered by an HCC tutor or faculty within 24 hours (usually under 6 hours). There are also several online math resources that you can find with an internet search. You may also find information on the Learning Web site accessible through your specific HCCS campus website.

EGLS₃ -- Evaluation for Greater Learning Student Survey System

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term. Visit www.hccs.edu/EGLS3 for more information.