Department of Mathematics
Statistics
SYLLABUS FOR MATH 1342
(Online)
Fall 2016/ 11298/ August 22- December 11, 2016
3 hour lecture course / 48 hours per semester/ 16 weeks
ISBN: 978-0-781-3633-7

Instructor: Mahmoud Basharat.

E-mail: Please use the email within Canvas for communications. You must use your HCCS email not your personal email for communications. If Eagle Online (Canvas) is unavailable please email me at mahmoud.basharat@hccs.edu .

Office hours: Northline Campus rm # 324. Hours: Monday & Friday 4:00 pm -6:00 pm by appointment only. Online Tuesday & Thursday 4:00pm – 5:30 pm.
Office Phone: 713-718-2438, (Please leave a message);
➢ I will return your email, or call within 48 hours.

Important Links:
• Eagle Online (Course Home Page) https://eo2.hccs.edu/login/index.php
  ➢ For technical support with Eagle Online please visit http://www.hccs.edu/online/technical-support/
• Connect MATH (Where you will find the Quizzes and HW assignments) https://www.connectmath.com/
  ➢ For technical support with Connect MATH; please visit their website: https://www.connectmath.com/support/contact_support
• HCCS Students Services: http://www.hccs.edu/online/student-services/
• Please visit the DE website http://de.hccs.edu/student-services/ for students services.
• HCCS Student Handbook: http://www.hccs.edu/district/students/
• HCCS Tutoring Services, please visit: http://www.hccs.edu/district/students/tutoring/

Browser troubles? Use the latest version of Firefox.
Materials Needed:

1. Connect Math Access Code: You must purchase the access code for Connect|Math. With Connect|Math, you will have access to an electronic version of the textbook. Connect|Math is an online homework/quiz system. You may purchase Connect|Math access code online. I will provide you with the course ID on the first day of class. The directions on how to create an account on Connect MATH are posted on the course homepage on Eagle Online. Connect Math: http://www.connectmath.com/

   Connect| Math offers you a free trial period of 10 days to access the homework. So please sign up for the homework on the first day of class. Make sure you buy the access code before the trial period expires.


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. 3 credit (3 lecture).

Prerequisites:
A grade of C or better in Math 0312 or a grade of C or better in MATH 1314 or its 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. Explain the use of data collection and statistics as tools to reach reasonable conclusions.
2. Recognize, examine and interpret the basic principles of describing and presenting data.
3. Compute and interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics.
4. Explain the role of probability in statistics.
5. Examine, analyze and compare various sampling distributions for both discrete and continuous random variables.
6. Describe and compute confidence intervals.
7. Solve linear regression and correlation problems.
8. Perform hypothesis testing using statistical methods.

Course Objectives:
Upon completion of this course, a student should be able to:
1. Demonstrate knowledge of statistical terms.
2. Understand the difference between descriptive and inferential statistics.
3. Identify types of data, measurement level of variables, and four basic sampling techniques.
4. Construct the relative frequency table from a given set of ungroup data.
5. Know and use the different graphs: histogram, frequency polygon, Ogives, Pareto, and pie to present data.
6. Compute the mean, median, mode, midrange, range, variance, and standard deviation.
7. Identify the various measures of position such as percentiles, deciles, and quartiles.
8. Find the total number of outcomes in a sequence of events using tree diagram and multiplication rule.
9. Understand the use of permutation and combination rules.
10. Determine sample spaces and find the probability of an event using classical probability.
11. Find the probability of compound events using addition and/or multiplication rules.
12. Find the conditional probability of an event
13. Construct a probability distribution for a random variable
14. Find the mean, variance, and expected value for a probability distribution function.
15. Find the mean, variance, and standard deviation for binomial distribution.
16. Identify the properties of the normal distribution.
17. Find a confidence interval for the mean when \( s \) is known or \( n > 30 \).
18. Determine the minimum sample size for finding a confidence interval for the mean.
19. Find a confidence interval for the mean when \( s \) is unknown and \( n < 30 \).
20. Find a confidence interval for proportion.
21. Determine the minimum sample size for finding a confidence interval for a proportion.
22. Find a confidence interval of variance and standard deviation.
23. Find the exact probability for \( X \) successes in \( n \) trial of a binomial experiment.
24. Find the area under the normal curve, given various \( z \) values.
25. Find probabilities for a normally distributed variable by transforming it into a standard normal variable.
26. Find specific data values for given percentages using the standard normal distribution.
27. Apply the central limit theorem to solve problems involving sample means.
28. Use the normal approximation to compute probabilities for a binomial variable.
29. Understand the definitions used in hypothesis testing.
30. State null hypothesis and alternative hypothesis.
31. Understand the terms: type I error and type II error, test criteria, level of significance, test statistic.
32. Find the critical values for the \( z \)-test, \( t \)-test, and \( c \)-test.
33. Test hypothesis for means (large and small sample), proportions, variance, and standard deviation.
34. Draw scatter plot for a set of ordered pairs.
35. Compute the correlation coefficient and the coefficient of determination.
36. Compute the equation of the regression line by using the least square method.
37. Test a distribution for goodness of fit using chi-square.
38. Test independence and homogeneity using chi-square.
39. Use the one-way ANOVA technique to determine if there is a significant difference among three or more means.
40. Determine the difference in means using the Scheffe’ or Tukey test if the null hypothesis is rejected in the ANOVA.

Core Objectives:
Given the rapid evolution of necessary knowledge and skills and the need to take into account global, national, state, and local cultures, the core curriculum must ensure that students will develop the essential knowledge and skills they need to be successful in college, in a career, in their communities, and in life. Through the Texas Core Curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world, develop principles of personal and social responsibility for living in a diverse world, and advance intellectual and practical skills that are essential for all learning.

Students enrolled in this core curriculum course will complete a research project or case study designed to cultivate the following 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.
Grading & Evaluation:
Your grade will be determined based upon how many points that you accumulate from quizzes, web activity, homework, and exams. The approximate number of points is as follows:

1. Four major examinations each is a 100 points.
2. A comprehensive final (200 points) The final exam will take place at the testing center located at 3100 main, Houston, TX 77002. If you are out of town then you must provide me with the information of the nearest college testing center near you during the first two weeks of class. If you can’t make it to the designated testing center please consider an alternative section that meets your needs.
3. Homework Assignments and Quizzes via Connect Math 100 points.

Final average = {Exam 1 + Exam 2 + Exam 3 + Exam 4 - (lowest exam grade) + HW Assignments and Quizzes + 2*Final Exam} Divided by 6.

- The final course average will be used in the usual manner (90-100 ”A”; 80-89 “B”; 70-79 “C”; 60-69 “D”; Below 60 “F”).

Tentative Calendar:
The following examinations dates are tentative. All dates are subject to change.

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<tr>
<th>Exam</th>
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<tr>
<td>Exam I (Online)</td>
<td>September 16- September 18</td>
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<td>Exam II (Online)</td>
<td>October 14 - October 16</td>
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<td>Exam III (Online)</td>
<td>November 11- November 13</td>
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<td>Exam IV (Online)</td>
<td>December 2- December 4</td>
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<tr>
<td>Final Exam (Proctored)</td>
<td>December 8 – December 10</td>
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The specific dates for the exams are posted on the course home page on Eagle Online and on Connect Math; also on the calendar in EO. Please, be sure to check the course calendar on EO and Connect Math often.

Final Examination: The final examination will consist of about 35 problems. The problems cover all the material required in the course (the final is comprehensive). The final exam will be proctered onsite at one of the designated testing centers.

No make-up exams will be given. If a student misses an exam then that will be his/her lowest exam. If a student misses a second exam, then that is a zero
**Make-up policy:**
There are **no make-up exams given for any exam under ANY circumstance**. If you miss one exam, then the final exam grade will replace that missed exam grade. **If you miss the second exam, you will get a ZERO.** Set your own personal calendars and electronic devices in advance to remind you of those dates. Again: the homework assignments will be on WebAssign, but the exams will be on EO2. **The loss of power, computer functionality or internet connection will NOT constitute an excuse for missing or not completing an exam. Technical access and compliance is strictly the student’s responsibility.** Remember: this is a distance education course. It is your responsibility to keep up with the course pace, instructions, policies, due dates, and timetable in general, including the assignment deadlines and exam dates. Do NOT procrastinate. Doing so will NOT pay off. You will run out of time. Please keep up with the course calendar on EO2.

**Students Outside of HCC Service Area:**
Students who live or work outside the HCC service area and cannot take exams at HCC testing locations MUST make arrangements at a proctored testing center in their area to take the final exam. It is a requirement that the final exam for this course be taken at an HCC-approved testing center. For more information and to obtain the required Proctor Approval Form, go to the DE Student Handbook and select “Testing Locations and Procedures” or contact DE department at http://www.hccs.edu/online/ for more information.

**Homework/ Lab policy:**
**Math 2413 online has Mandatory WebAssign Homework that must be done on WebAssign site (www.webassign.net) by all students.** The homework assignments can be done from your home computer, the Math Lab computers on Campus, or the computers in the Open Lab; you can even load it on your tablet or smart phone. To register into the homework for my section, use The Class Key that is given in Eagle Online 2 (EO2). The WebAssign homework counts 100 points. This homework is not optional. There is a deadline for completion for each exercise set. Usually they are due on the Exam Dates. Be sure you are aware of these dates; they will affect your homework grade.

**Note:**
- It is important that your name on all your work for this class matches HCCS record. I will not change any grade if you use different last name or a nickname!
- The due dates for all the homework assignments and quizzes are posted on Connect MATH. Please be sure to adhere by the deadline. There will be **no extension**!
- The quizzes and homework assignments for this course are administered on-line and may be taken at a location of your convenience. **Pursuant to Math Department policy some of the examinations including the Final Exam are administered online at an HCC Testing Center**
- **The dates for all the exams and the daily assignments will be posted on the Course Calendar on Eagle-Online and Connect Math.**

**Where to get help**
- Come see me during my **office hours**.
- Visit to the nearest HCCS **Mathlab**: http://www.hccs.edu/district/students/tutoring/  
- Visit http://www.hccs.edu/district/students/tutoring/  
HCC Course Withdrawal Policy
Texas imposes penalties on students who drop courses excessively. Students are limited to no more than SIX total course withdrawals throughout their educational career at a Texas public college or university. To help students avoid having to drop/withdraw from any class, HCC has instituted an Early Alert process by which your professor will “alert” you and distance education (DE) counselors that you might fail a class because of excessive absences and/or poor academic performance. Contact your DE professor or a DE 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. **It is the student responsibility to withdraw from the class before the withdrawal deadline.** If you do not withdraw before the deadline, you will receive the grade that you have earned by the end of the semester. Zeros averaged in for required assignments/tests not submitted will lower your semester average significantly, most likely resulting in a failing grade (“F”).

The last day for student withdrawals is Friday, October 28, 2016.

PLEASE REMEMBER THAT AS A MEMBER OF THE HCCS ACADEMIC COMMUNITY YOU ARE BOUNDED TO OBSERVE THE ACADEMIC HONESTY CODE (SEE THE HCCS STUDENT HANDBOOK) IN ALL YOUR SCHOOL WORK: [http://www.hccs.edu/district/students/](http://www.hccs.edu/district/students/)

Internet Course Policies:

- It is important that we behave as an adult in this course!! I will not tolerate any rudeness or any impropriate language; so please if there is an issue or a problem let me know and I’ll do my best to resolve the issue.

- You need, constantly on a daily basis, to check the calendar, course work, e-mail and other links on the course homepage on Eagle Online to ensure a successful and timely completion.

- Check the course calendar for events, and examination dates.

- The results of the exam will be comunicated to you within a week through Eagle Online. If you have any question over any test grade and you would like to review it, then you must arrange an appointment with me to discuss your grade.

- All students must acquire access code to the Course Material.i.e.User name and Password. If you have any problem with loging to the course website please contact one of the Distance Education Technicians: desupport@hccs.edu

- It is extremely important that you take the exam during the scheduled time!!!!

- Communication is the most problematic area in distance education. Remember that we don't see face to face, and so we are not able to read body languages and interact with each other as in a traditional class room.

- It is important that you do your homework and practice in this course. It is absolutely essential that you do as much of the homework as posible, **if you don’t do the assigned homework, I can almost guarantee that you will not be successful in this course.** I will be glad to answer questions about the homework problems during chat sessions and on the Discussion Forums.
**Caution:** There is one word that best summarizes the major difficulty that most people have taking a course online: procrastination! You will have great excitement and good intentions in the beginning, but as the course progresses, there will be a tendency to put off it just one more day while you do other urgent tasks. Soon the ‘one more day’ becomes a week and you are hopelessly behind! I will do my best to help keep you on track, but of the discipline must come from you. It is imperative that you follow the calender that I will lay out for you if you plan to succeed.

**HCCS Tutoring Services:**

HCC provides FREE live tutoring at various centers indifferent campuses system-wide. Please click on the link [http://ctle3.hccs.edu/alltutoring/index.php?-link=stuFind](http://ctle3.hccs.edu/alltutoring/index.php?-link=stuFind) to find out the days, times and location of math tutoring at the campus most convenient to you. HCCS also offers a free online tutoring, to take advantage of this service please visit [http://hccs.askonline.net/](http://hccs.askonline.net/)

**Student Services:**

The Distance Education Student Handbook contains policies and procedures unique to the DE student. Students should have reviewed the handbook as part of the mandatory orientation. It is the student's responsibility to be familiar with the handbook's contents. The handbook contains valuable information, answers, and resources, such as DE contacts, policies and procedures (how to drop, attendance requirements, etc.), student services (ADA, financial aid, degree planning, etc.), course information, testing procedures, technical support, and academic calendars. Refer to the DE Student Handbook by visiting this link: [http://de.hccs.edu/de/de-student-handbook](http://de.hccs.edu/de/de-student-handbook)

**INTERNATIONAL STUDENTS:** Receiving a W in a course may affect the status of your student Visa. Once a W is given for the course, it will not be changed to an F because of the visa consideration. International Students are restricted to ONLY ONE online/distance education course each semester. Please contact the International Student Office at 713-718-8520 if you have any questions about your visa status and other course issues.

**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 appropriate HCC Disability Support Service (DSS) Counselor at the beginning of each semester. Faculty is authorized to provide only the accommodations requested by the Disability Support Services Office.”

Students who are requesting accommodations must first contact the appropriate (most convenient) DSS Counseling office for assistance:

[http://www.hccs.edu/district/students/disability-services/ada-counselors/](http://www.hccs.edu/district/students/disability-services/ada-counselors/)

Central College
713.718.6164
Coleman College
713-718-7376
Northeast College
713-718-8322
Northwest College
After student accommodation letters have been approved by the DSS office and submitted to DE Counseling, students will receive a confirmation email along with instructions regarding completion of the requested accommodation(s).

**HCC Policy Statement: Title IX:**

HCC is committed to provide a 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.

Title IX of the Education Amendments of 1972 requires that institutions have policies and procedures that protect students’ rights with regard to sex/gender discrimination.

Information regarding these rights are on the HCC website under Students-Anti-discrimination. Students who are pregnant and require accommodations should contact any of the ADA Counselors for assistance. It is important that every student understands and conforms to respectful behavior while at HCC.

Sexual misconduct is not condoned and will be addressed promptly. Know your rights and how to avoid these difficult situations.

Log in to www.edurisksolutions.org. Sign in using your HCC student email account, then go to the button at the top right that says Login and enter your student number.

**DISTANCE EDUCATION ADVISING AND COUNSELING SERVICES:**
Advising can be accomplished by telephone at 713/718-5275 - option # 4 or via email at decounseling@hccs.edu. Confidential sessions with the distance education counselors will help students understand admissions, registration, entrance testing requirements, degree planning,
transfer issues, and career counseling. HCC counselors also maintain a local referral base in order to provide appropriate referrals to students with personal or family issues that may require long-term solutions.

**NOTICE FOR STUDENTS WHO LIVE OUTSIDE OF HOUSTON:**
Students who live outside the Houston area and cannot take paper exams at one of our HCC testing locations MUST make arrangements for a proctor. Please see the DE Student Services webpage for information at the following URL: 
http://distance.hccs.edu/de-counseling/student_out_houston.htm

**VIRTUAL CLASSROOM CONDUCT:** As with on-campus classes, all students in HCC DE courses are required to follow all HCC Policies & Procedures, the Student Code of Conduct, the Student Handbook, and relevant sections of the Texas Education Code when interacting and communicating in a virtual classroom with faculty and fellow students. Students who violate these policies and guidelines will be subject to disciplinary action that could include denial of access to course-related email, discussion groups, and chat rooms or being removed from the class.

**USE OF CAMERAS OR RECORDING DEVICES:**
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.

**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.

**Course Outline:**

| Unit I – The Nature of Probability and Statistics | Sections: 1.1-1.5 |
| 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. |

| Unit 2 – Frequency Distribution and Graphs | Sections: 2.1-2.3 |
| 3 hours | |
|  |  |
This unit covers data in frequency distributions and tables, graphs of frequency polygons, histograms, ogives, pareto charts, and time series. Quartiles, and outliers.

**Unit 3 – Data Description**

Sections: 3.1-3.4

(6 hours)

This unit covers measures of central tendency, measures of variation, and measures of position. 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, and outliers.

**Unit 4 – Probability and Counting Rules**

Sections: 4.1-4.5

(4.5 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.

**Unit 5 – Discrete Probability Distributions**

Sections: 5.1-5.4.

(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.

**Unit 6 – Normal Distribution**

Sections: 6.1-6.4

(6 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.

**Unit 7 – Confidence Intervals and Sample size**

Sections: 7.1-7.4

(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 \( n \geq 30 \), 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.

**Unit 8 – Hypothesis Testing**

Sections: 8.1-8.4

(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 9 – Testing the difference**

*(Sections: 9.1-9.5)*

*(4.5 hours)*

This unit begins with testing the difference between two means, two proportions, and two variance

**Unit 10 – Correlation and Regression**

*(Sections: 10.1-10.3)*

*(4.5 hours)*

This unit begins Scatter Plots and correlation. Topics include regression, line best fit, and coefficient of determination of standard error of the estimate

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**Administration contact information**

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For issues related to your class, please first contact your instructor.
If you need to contact departmental administration, then contact the appropriate Associate Chair.
If further administrative contact is necessary, then contact the appropriate Department Chair.

**Modifications:**
The syllabus is subject to change as needed to meet the objectives of the course or to aid the course administration at the discretion of the instructor. Any modifications to this syllabus will be announced on the course website in HCCS Eagle Online. It is your responsibility to check for such announcements.