STEM Course Syllabus

COURSE: MAT 114

CREDITS: 3

COURSE TITLE: Introduction to Probability and Statistics

INSTRUCTOR:

DAY(S) AND TIME(S):

LOCATION(S):

OFFICE HOURS:

OFF. LOCATION:

EMAIL:

TELEPHONE: *You are not required to give your phone number to students. If you choose not to provide a number, you may delete this line from the syllabus. If you choose to give a phone number, it is advised that you do so through an application such as Google Voice rather than providing your personal phone number.*

COURSE DESCRIPTION: This course offers an analysis of the basic ideas and methods of collecting, tabulating, and representing data. Topics include frequency distributions, histograms and frequency polygons: measures of central tendency, variability percentiles; Z-scores, Elementary probability, binomial and normal distributions; linear regression and correlation, and hypothesis testing.

COURSE PREREQUISITE: Exit CPT in Basic Math and Algebra

COURSE OBJECTIVES:

Probability theory is the sector of mathematics that deals with presenting uncertainty. It is applied in different areas: Biology such as genetics, Psychology, Economics and finance, Theoretical Physics. This course provides an introduction to probability theory, random variables and Markov processes. Topics covered are: probability axioms, conditional probability; Bayes' theorem; discrete random variables, moments, bounding probabilities, probability generating functions, standard discrete distributions; continuous random variables, uniform, normal, Cauchy, exponential, gamma and chi-square distributions, transformations, the Poisson process; bivariate distributions, marginal and conditional distributions, independence, covariance and correlation, linear combinations of two random variables, bivariate normal distribution; sequences of independent random variables, the weak law of large numbers, the central limit theorem; definition and properties of a Markov chain and probability transition matrices; methods for solving equilibrium equations, absorbing Markov chains.

STUDENT LEARNING OUTCOMES:

Analyze the issues and problems associated with collecting and interpreting data from surveys, polls, and other statistical studies.

1. Apply the appropriate tabular and graphical formats for displaying univariate data sets and correctly summarize information about the center and spread of a univariate data set.
2. Apply the concepts of probability, random variables and their distributions, in particular the binomial distribution and normal distributions to data drawn from real-world statistical applications.
3. Apply the concepts of estimation (confidence intervals) and hypothesis testing for population averages and percentages to datasets drawn from real-world statistical applications.
4. Select and produce the appropriate tabular and graphical formats for displaying bivariate data sets.
5. Analyze data using correlation, regression and chi-square analyses.

TEXTBOOK & SUPPLEMENTAL MATERIALS: Statistics, Charles Henry Brase, Corrine Pellilo Brase, 8th Edition, ISBN: 13:978-1-337-55809-9

ATTENDANCE
For your reference, the college policy is generally that a student may fail a course due to lack of attendance if s/he missed more than 6 hours of instructional time for a 3-credit course.
As a result, student may fail the course due to three absences in MAT 114 class.
GRADING POLICY

BREAKDOWN OF GRADING:
Project, in class participation, presentation, lab reports:	20%
Exams: There are three in class exam:	50%
Final: cumulative final exam:	30%

The grade scale for this class will be as follows:

This is a sample grading scale. You may adjust (within reason) to your own policy regarding grading. Note: At HCCC, we do not have a grade of C-.

100 – 94	= A		
93 – 90	= A-	79—77	= C+
89 - 87	= B+	76—70	= C
86—84	= B	69—60	= D
83—80	= B-	Below 60	= F

'**MANDATORY USE OF HCCC EMAIL ADDRESS**
Members of the HCCC community are required to check their official HCCC email address in order to stay current with College and course communications. All college business communication between faculty, students, and staff must be sent via an official HCCC email address. If an employee or student elects to forward or link his/her HCCC email to a separate and private account, that individual remains responsible for all material transmitted to that account. Employees of HCCC shall not be responsible for any material that remains undelivered, due to defects in the private non-HCCC accounts. Failure in the operations of private email accounts shall not be cause for excuse from communications between the student and the employee. Students that encounter difficulty with HCCC email should view the FAQ's section on the Portal.

INCOMPLETE
An INCOMPLETE grade for the course is given under specific conditions when a student, because of serious and unexpected reasons, cannot complete the requirements of the course. For example, if a student did not attend the final because of illness his or her excuse must be verified by a physician. Other absences from other assigned activities must be made up at another appointed time. To arrange for an incomplete grade, the student must see the instructor before final exam, so proper documentations could established and submitted to Division and The office of Academic Affairs.

DISABILITY SUPPORT SERVICES:
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Students with disabilities who believe that they might need accommodations in this class are encouraged to contact Disability Support Services at (201) 360-4157, as soon as possible to better ensure that such accommodations are implemented in a timely fashion. All disabilities must be documented by a qualified professional such as a Physician, Licensed Learning Disabilities Teacher Consultant (LDTC), Psychiatrist, Psychologist, Psychiatric Nurse, Licensed Social Worker or Licensed Professional Counselor, who is qualified to assess the disability that the student claims to have and make recommendations on accommodations for the student. All information provided to the Disability Support Services Program will be confidential between the program, professors involved with the student and individual student.

ACADEMIC INTEGRITY
Academic Integrity Standards
Academic integrity is central to the pursuit of education. For students at HCCC, this means maintaining the highest ethical standards in completing their academic work. In doing so, students *earn* college credits by their honest efforts. When they are awarded a certificate or degree, they have attained a goal representing genuine achievement and can reflect with pride on their accomplishment. This is what gives college education its essential value.

<u>Violations of the principle of academic integrity include:</u>
- Cheating on exams.
- Reporting false research data or experimental results.
- Allowing other students to copy one's work to submit to instructors.
- Communicating the contents of an exam to other students who will be taking the same test.
- Submitting the same project in more than one course, without discussing this first with instructors.
- Submitting *plagiarized* work. *Plagiarism* is the use of another writer's words or ideas without properly crediting that person. This unacknowledged use may be from published books or articles, the Internet, or another student's work.

<u>Violations of Academic Integrity</u>
When students act dishonestly in meeting their course requirements, they lower the value of education for all students. Students who violate the college's policy on academic integrity are subject to failing grades on exams or projects, or for the entire course. In some cases, serious or repeated instances of academic integrity violations may warrant further disciplinary action.

Detailed information on the College's Academic Integrity policy may be found in the *HCCC Student Handbook*. The handbook also contains useful information for students on completing research projects and avoiding plagiarism.

Your personal policy for a violation of the College's academic integrity policy go here. You must include this information for your students.

OTHER
Any other information, policies, etc. that you feel a student needs to know can go here.

TENTATIVE COURSE SCHEDULE

Session	Chapter	Topic	SLO
1. 2.	**Introduction Organizing Data**	• Frequency Distribution • Stem-and-Leaf Display	1, 2
3. 4.	**Averages and Variation Test #1**	• Measures of Central Tendency • Measures of Variation • Percentiles	2
5.	**Correlation and Regression**	• Scatter Diagrams and linear regression • Linear Regression and the coefficient of Determination	1, 6
6. 7.	**Elementary Probability Theory Test #2**	• Introduction • Compound Events • Counting Techniques	3
8. 9.	**Binomial Probability Distribution**	• Introduction to Random Variables and Probability Distributions • Binomial Probabilities • Additional Properties of the Binomial Distribution	3
10. 11.	**The Normal Curves and Sampling Distributions Test #3**	• Graphs and the Standard Normal Distribution • Nonstandard Normal Distribution • The Central Limit Theorem • Normal Approximation to the Binomial Distribution	2, 3, 5 , 6
12.	**Estimation**	• Estimating μ When σ is known • Estimating μ When σ is Unknown • Estimating ρ in The Binomial Distribution	4
13.	**Hypothesis Testing Exam review**	• Introduction to statistical Tests	4

14.		• Testing the mean μ • Testing a Proportion ρ	
15.	**Final exam**		