



MTH 220–Introduction to Probability and Statistics Course Syllabus

Course description: Probability, random variables, mean and variance, binomial distribution, normal distribution, statistical inference, and linear regression.

Credit hours: 3

Course Prerequisites and Corequisites: See general course prerequisites.

Course outline:	<u>Approximate time spent</u>
• Descriptive Statistics	10%
○ Graphical Display of Data	
○ Measures of location	
○ Measures of Dispersion	
• Probability	20%
○ Classical Probability	
○ Probability Laws (Rules)	
○ Counting Techniques	
• Probability Distributions	20%
○ Random Variables	
○ Discrete Distributions	
▪ Binomial Distribution	
▪ Hypergeometric Distribution	
○ Continuous Distributions	
▪ Uniform Distribution	
▪ Normal Distribution	
• Sampling Distributions	10%
○ Random Samples	
○ Central Limit Theorem	
• Statistical Inference	35%
○ Estimation	
▪ Point Estimation	
▪ Interval Estimation	
○ Hypothesis Testing	
• Linear Regression	5%

Student Learning Outcomes (SLO): At the end of MTH 220, a student who has studied and learned the material should be able to:

1. Exhibit an understanding of basic probability rules and concepts. [PLO: 1,2,3], [EEO: 1,2,3,6]
2. Demonstrate an understanding of different probability models and ways they are used in statistical inference. [PLO: 2], [EEO: 1,2,3,6,7]
3. Demonstrate an understanding of point estimation of population parameters. [PLO: 2], [EEO: 1,2,3,4,5,6]
4. Demonstrate an understanding of interval estimation about population parameters and inference that can be drawn from such techniques. [PLO: 2], [EEO: 1,2,3,4,5,6,7]
5. Demonstrate an understanding of hypothesis testing concerning population parameters and inference that can be drawn from such techniques. [PLO: 2], [EEO: 1,2,3,4,5,6,7]

Program Learning Outcomes (PLO):

Students graduating from SFASU with a B.S. degree and a major in mathematics will:

1. Demonstrate comprehension of core mathematical concepts. [**Concepts**]
(notion of theorem, mathematical proof, logical argument)
2. Execute mathematical procedures accurately, appropriately, and efficiently. [**Skills**]
(calculus, algebra, routine, nonroutine, applied)
3. Apply principles of logic to develop and analyze conjectures and proofs. [**Logical Reasoning**]
(quantifiers, breaking down mathematical statements, counterexamples)

Exemplary Educational Objectives (EEO):

1. To apply arithmetic, algebraic, geometric, higher-order thinking, and statistical methods to modeling and solving real-world situations.
2. To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
3. To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
4. To use appropriate technology to enhance mathematical thinking and understanding and to solve mathematical problems and judge the reasonableness of the results.
5. To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.
6. To recognize the limitations of mathematical and statistical models.
7. To develop the view that mathematics is an evolving discipline, interrelated with human culture, and understand its connections to other disciplines.