UDESC
UNIVERSIDADE
DO ESTADO DE
SANTA CATARINA

UNIVERSIDADE DO ESTADO DE SANTA CATARINA
CENTRO DE CIÊNCIAS DA ADMINISTRAÇÃO
E SÓCIO-ECONÔMICAS – ESAG

ESAG

SYLLABUS

I.   IDENTIFICACION

Degree Course: Economics		
Department: Ciências Econômicas - DCE		
Course: Basic Statistics		**Code:**
Working Hours: 72 hours/class – 6 ECTS	**Academic year:** 2025/1	**Phase:** Elective class
Professor: Silvio Hong Tiing Tai, Ph.D.		
E-mail Contact: silvio.tai@udesc.br		

II.   SUMMARY

Descriptive Statistics. Fundamental Notions of Probability. Conditional Probability and Independence. One-Dimensional Random Variables. Random Variables of Two or More Dimensions. Expected Value and Variance of a Random Variable. Bernoulli, Binomial, Poisson, Geometric, Hypergeometric, Uniform, Normal and Exponential Probability Distributions.

III.   GOALS AND OBJECTIVES

This course is the first step in the statistics branch of the undergraduate economics program. As a foundational course, it qualifies as a stepping stone to a multitude of interdisciplinary courses involving statistics, as exemplified by the definition of data scientist as "A person who is better at statistics than any software engineer and better at software engineering than any statistician." (Josh Wills, former head of data engineering at Slack). The course introduces students to the concepts of descriptive statistics, probability, and probability distributions.

IV.   DIDACTIC PROGRAM

Topic 1. Descriptive Statistics
Position measures. Variability measures. Weighted average and working with grouped data. Measures of association between two variables. Other measures.

Topic 2. Introduction to Probability
Set Theory. Experiments, Sample Space, Events, Relative Frequency. Fundamental Notions of Probability. Equally Likely Results, Enumeration Methods. Conditional Probability. Bayes' Theorem. Independent Events.

Topic 3. Discrete Random Variables (One-Dimensional Case)
General notion of random variables. Discrete random variables. Mathematical expectation and their properties. Variance, covariance and their properties. Cumulative distribution function. Probabilistic models for discrete random variables: Discrete Uniform Distribution; Bernoulli Distribution; Binomial Distribution; Hypergeometric Distribution; Poisson Distribution.

Topic 4. Continuous Random Variables (One-Dimensional Case)
Definitions. Probabilistic models for continuous random variables: Uniform Model; Normal Model; Exponential Model.

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Topic 5. Random Variables of Two or More Dimensions
Joint distribution. Marginal and conditional distributions. Independent random variables.

V.   LEARNING METHODOLOGY

This course alternates between lectures on concepts and classes with concrete applications of these concepts, giving the student a leadership role in taking the initiative to solve problems with statistical concepts.

The application classes have the objective of helping learning and are given in the form of exercises that can be solved collectively and/or with the help of the professor.

IV.   ASSESSMENT SYSTEM

- Students will be assessed through three individual, closed-book tests and through assignments in the application classes, which will take place at each meeting during the semester. These assignments are submitted individually via Moodle (an online teaching platform), but collective resolution is permitted and encouraged.
- Each test has a weight of 20% and the average of the assignments has a weight of 40%.
- Late assignments will not be counted.

- Final Average = (Test 01 * 0.20) + (Test 02 * 0.20) + (Test 03 * 0.20) + (Assignment Lists * 0.40)

- Students must have a minimum attendance of 75% to pass the course.

- Second call exams will only be held according to what is stated in resolution no. 018/2004-CONSEPE.

V.   BIBLIOGRAPHY

BASIC BIBLIOGRAPHY

Camm, Jeffrey D.; Cochran, James J.; Fry, Michael J.; Ohlmann, Jeffrey W.; Anderson, David R.; Sweeney, Dennis J.; Williams, Thomas A. **Statistics for Business and Economics.** Cengage, ISBN: 9780357715994

DeGroot, Morris H., and Mark J. Schervish. *Probability and Statistics*. 3rd ed. Boston, MA: Addison-Wesley, 2002.

HyperStat Online Textbook

Larsen, R., and M. Marx. *Introduction to Mathematical Statistics and Its Applications*. 4th ed. Upper Saddle River, NJ: Pearson Prentice Hall, 2005. ISBN: 9780131867932.

Lindgren, B. *Statistical Theory*. 4th ed. New York, NY: Chapman and Hall, 1993. ISBN: 9780412041815.

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SUPPLEMENTARY BIBLIOGRAPHY

Ekeland, I. *The Broken Dice and Other Mathematical Tales of Chance*. Chicago, IL: University of Chicago Press, 1996. ISBN: 9780226199924.

Huff, D., and I. Geis. *How to Lie With Statistics*. New York, NY: W.W. Norton, 1993. ISBN: 9780393310726.

Stigler, S. *The History of Statistics: The Measurement of Uncertainty before 1900*. Cambridge, MA: Belknap Press of Harvard University Press, 1990. ISBN: 9780674403413.

———. *Statistics on the Table: The History of Statistical Concepts and Methods*. Cambridge, MA: Harvard University Press, 2002. ISBN: 9780674009790.
Taleb, N. *Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets*. 2nd ed. New York, NY: Random House, 2008. ISBN: 9781400067930.

* Auxiliary bibliographies may be indicated during the semester.

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