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SUBJECT SYLLABUS
ACADEMIC OVERVIEW
INTERNATIONAL SCHOOL OF ECONOMIC \& ADMINISTRATIVE SCIENCES
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COURSE NAME AND CODE: Probability \& Statistics I (21303) PROGRAM:

Bachelor of Business Administration (BBA)
Bachelor of Administration \& Service (BA\&S)
Bachelor of International Business (BIB)
LEVEL OF STUDY: Undergraduate Programme

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Bachelor of International Marketing \& Logistics Administration (BIMLA)
Bachelor of Economics \& International Finance (EIF)
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| GENERAL ACADEMIC INFORMATION |  |  |  |  |  |
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| LATEST UPDATE | 2020-2 |  |  |  |  |
| ACADEMIC DEPARTMEN T | Mathematics \& Statistics |  |  |  |  |
| SUBJECT TYPE | Mandatory |  |  |  |  |
| LANGUAGE | Spanish |  |  |  |  |
| SEMESTER |  |  |  |  |  |
|  | BBA | 4 |  |  |  |
|  | BA\&S | 4 |  |  |  |
|  | BIB | 4 |  |  |  |
|  | BIMLA | 4 |  |  |  |
|  | EIF | 3 |  |  |  |
| NUMBER OF ACADEMIC CREDITS | 2 |  |  |  |  |
| HOURS OF ACADEMIC WORK | 96 | Contact hours | 64 | Hours of independent/autonomous work | 32 |

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| LEARNING PREREQUISIT ES | - Read, write and interpret mathematical notation, tables, diagrams and graphs. <br> - Apply algebraic operation properties to solve and evaluate problems in different contexts. <br> - Model situations in different contexts with one variable functions <br> - Analyze functions from their concepts and properties <br> - Calculate derivatives applying properties. |  |  |  |  |  |
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| INTERNATIO NAL COMPONENT | - Vocabulary and technical language to communicate in different cultural contexts. |  |  |  |  |  |
| SUSTAINABLE DEVELOPME NT GOALS (SDG) | 4. Quality Education |  |  |  |  |  |
| COURSE DETAILS |  |  |  |  |  |  |
| COURSE DESCRIPTION | Probability \& Statistics I develops and secures mathematical reasoning around the central theme of probabilistic and statistical reasoning, centered in themes such as data analysis, localization and distribution measures, random variables, probability of events, continuous and discrete probability distributions, mean, variance, and applications. The course Probability \& Statistics provides different tools to analyze, model, solve and interpret problems related with daily situations which involve concepts of randomness, make decision taking easier. In the process of research, gathering data, its description, analysis, representation and interpretation is crucial, and its precisely Statistics the one that can provide the necessary knowledge to succeed. In the same way, there are numerous processes which involve some degree of uncertainty for which the use of probability concepts will be able to model them correctly. |  |  |  |  |  |
| KEY WORDS: | Statistics, data visualization, random process |  |  |  |  |  |
|  | EICEA ILOS <br> or <br> Programme ILOS | Course ILOS | Type | Content | Teaching and Learning strategy | Assessment Method |
| COMPETENC ES DEVELOPED | ILO01 <br> ILOO2 <br> ILO03 <br> ILOO4 <br> BBA ILO08 <br> BIB ILO08 | Classifies sets of data, differentiating characteristics which identify the types of variables | Knowledge | Introduction <br> 1. Definitions of population, parameters, deterministic models, probabilistic models, and sample. <br> 2. Basic concepts of census and sampling | Discovery Based Learning | Progress in indicators of learning or performance are evaluated in different instances throughout the |


|  |  |  |  | 3. Presentation of Excel tools |  | semester with quizzes, workshops, homework, group projects, individual tests, and a final exam, in which the student must demonstrate the learning objectives of the course. <br> Rubrics will be used to evaluate de |  |
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|  | ILO01 ILO02 ILO03 ILO04 BBA ILO08 BIB ILO08 | Represents sets of data which have the same characteristics with tables and graphs. | Skill | Descriptive statistics <br> 1. Definitions and types of variables (qualitative and quantitative) <br> 2. Definitions and examples of types of qualitative variables (nominal and ordinal) <br> 3. Definitions and examples of types of quantitative variables (discrete and continuous) | Theoretical Class |  |  |
|  | ILO01 ILO02 ILO03 ILO04 BBA ILO08 BIB ILO08 |  | Skill | Descriptive statistics <br> 4. Descriptions of numeric and graphic data <br> a. Numerically: frequency distribution for quantitative variables, group and ungrouped data. <br> b. Frequency histograms <br> 5. Central tendency measures <br> a. Mean, median, mode <br> 6. Quartiles and Boxplot <br> 7. Dispersion measures (variance, standard deviation, variance coefficient) | Simulation Based Learning |  | learning evidence and the respective feedback of the process and final answer. Exam feedback will be individual and collective work feedback will be given in groups. |
|  | ILO01 ILO02 ILO03 ILO04 BBA ILO08 | Calculates and interprets the probability and algebra of events, as well as their probabilistic properties. | Skill | Probability <br> 1. Definition of events and samples space <br> 2. Venn diagrams and algebraic events | Theoretical Class |  |  |


|  | BIB ILO08 |  |  | 3. Content methods <br> 4. Probability axioms |  |
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|  | ILO01 <br> ILO02 <br> ILO03 <br> ILO04 <br> BBA ILO08 <br> BIB ILO08 | Identifies the cause-effect relation applying conditional probabilistic calculations. | Knowledge | Probability <br> 5. Probability of an event and equiprobable events <br> 6. Independent events <br> 7. Conditional probability, independence and product rule <br> 8. Total probability theorem | Theoretical Class |
|  | ILO01 <br> ILO02 <br> ILO03 <br> ILO04 <br> BBA ILO08 <br> BIB ILO08 | Applies Bayes theorem in different contexts | Skill | Probability <br> 9. Bayes theorem | Problems Based Learning |
|  | ILO01 <br> ILO02 <br> ILO03 <br> ILO04 <br> BBA ILO08 <br> BIB ILO08 | Deducesprobability <br> functions of <br> random <br> variables to identify <br> probability <br> properties, as <br> well as the expected value <br> and variance l | Skill | Random variables and Probability distributions <br> 1. Random variable concept <br> 2. Discrete probability distributions <br> 3. Continuous probability distributions <br> Mathematical expectation <br> 1. Expected value and its properties <br> 2. Calculation of expected value of random discrete and continuous variables <br> 3. Variance of a random variable and standard deviation | Theoretical Class |


|  | ILO01 <br> ILO02 <br> ILO03 <br> ILO04 <br> BBA ILO08 <br> BIB ILO08 | Applies continuous and discrete probability distributions to solve problems which can me associated to usual distributions. | Skill | Known Discrete Probability Distributions <br> 1. Binomial distribution <br> 2. Hypergeometric distribution <br> 3. Negative binomial distribution <br> 4. Poisson distribution <br> Known Continuous Probability Distributions <br> 1. Normal distribution <br> 2. Applications of normal distribution <br> 3. Approximation of a binomial distribution to a normal distribution <br> 4. Gamma and exponential distributions <br> 5. Chi-Squared distribution <br> 6. Beta distribution | Problems Based Learning |  |
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|  | ILO01 <br> ILO02 <br> ILO03 <br> ILO04 <br> BBA ILO08 <br> BIB ILO08 | Uses sample distributions to model the behavior of the central measures and dispersion of a set of data. | Skill | Fundamental sample distributions and data description <br> 1. Sample statistics <br> 2. Sample distributions <br> 3. Mean distribution and central limit theorem <br> 4. Sample distribution for variance <br> 5. T distribution <br> Intervals of confidence <br> 1. Confidence intervals for the mean in a sample with known variance | Problems Based Learning |  |

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