**Kathmandu University School of Management**

#### Course plan

**Program : MBA / EMBA Semester :** First

**Course title :** **Statistical Analysis for Managerial Decision**

**Course code : MAS 501 Credit hours :** 3

# **Instructor’s Personal**

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**INTRODUCTION:**

The statistical methods are used in various functional areas of business. A few examples are in order: finance uses it to find optimal portfolio combinations or to forecast financial variables; marketing uses it to study preference of consumers when economic or other environments for a product’s market are changed, or to study the effect of advertising or of changes in strategic behavior on sale; management may use it to study the quality of products or the effect on quality of an intervention; accounting could use it to measure the variability or determinants of cost. This is not an exhaustive list. To be a complete manager, you should knowledge of collecting, organizing, modeling, analyzing and interpreting data for your business.

**COURSE OBJECTIVES (CO):**

1. To help understand the concept of probability and various probability distributions having applications to management discipline.
2. To explore relation between population and sample, and how sample information is connected to population attributes.
3. To examine applications of various statistical methods in exploring the nature of relation in and across variables.
4. To introduce SPSS software for entering and presenting data, as well as for modeling management problems and interpreting results.

**COURSE LEARNING OBJECTIVES (CLO):**

Upon successful completion, this course will enable participants to:

1. Understand the data, variable, scale and descriptive summery measures
2. Identify appropriate distribution to apply in a management problem, and compute probabilities for single and joint random variables, manually.
3. Use inferential statistics for hypothesis testing.
4. Test hypothesis about single and two population means and proportions, and analyze their business relevance.
5. Model management problems by using ANOVA, Contingency analysis and non-parametric methods.
6. Model management problems through regression equation, analyze and interpret the results.
7. Use suitable sampling technique for a research problem and understand its limitations.
8. Have insights into what management problems can be studied with which statistical methods.

**EVALUATION:**

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| **S. No.** | **Evaluation Criteria** | **Unit of Evaluation** | **Weight (%)** |
| 1 | Mid-term Examination | Individual | 20 |
| 2 | Individual Assignment, class test, Quiz etc. | Group/individual | 20 |
| 3 | Group assignment, class test and quiz | Group/individual | 10 |
| 4 | Project work/ Presentation | Group/individual | 20 |
| 5 | End-term Examination | Individual | 30 |
|  | Total |  | 100 |

**Grading and Assessment criterion in letter grade and grade point.**

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| --- | --- | --- |
| **Marks Range** | **Grade** | **Grade Point** |
| **100-85** | **A** | **4** |
| **84 - 80** | **A-** | **3.7** |
| **79 -75** | **B+** | **3.3** |
| **74 - 70** | **B** | **3** |
| **69 - 60** | **B-** | **2.7** |
| **59-50** | **C+** | **2.3** |
| **49-45** | **C** | **2** |
| **44 - 40** | **D** | **1** |
| **Less than 40** | **F** | **0** |

**PRESCRIBED TEXTBOOK:**

Ken Black, 2012, *“Applied Business Statistics making better business decisions”*, 7th ed, Wiley INDIA EDITION.

**ADDITIONAL REFERENCES:**

1. Levin Richard, Rubin David. Statistics for Management. Prentice-Hall India. Seventh ed.
2. Levind David, Krehbiel Timothy and Berenson Mark. Business Statistics: A first course. Pearson education. Fourth ed.
3. Aczel, Amir & Sounderpandian J. Complete Business Statistics. Tata McGraw Hill. 6th edition.
4. Albright Christian, Winston Wayne and Zappe Christopher J. Data analysis and decision making. Thomson International Student Edition. Second ed.
5. Beri G. C. Business Statistics. Tata-McGraw Hill. Second edition.

Note: late submitted assignments will not be considered and will be awarded zero

Note: In every session, each student should bring his/her own calculator.

Note: each student should bring his/her own laptop when need is felt in the class delivery.

**Course Content /Session Plan:**

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| **SN** | **Topic** | **3 hours session** | **Concepts** | **Prior reading** |
| 1 | Descriptive Summary measures s | 1 | * Introduction to statistics, data, variables, measurement scale, central tendency, measure of variation, and nature of data | Chapter 1,2, and 3  Ken Black |
| 2 | Probability | 1 | * Methods of assigning probability & its structure * Marginal, joint & conditional probabilities, independent events * Bayes’ rule | Chapter 4  Ken Black |
| 3 | Discrete Distributions | 1 | * Characteristic of a discrete random variable; mean, variance & standard deviation * binomial distribution and its mean & standard deviation; computing of binomial probabilities, its applications * Poisson Distribution; mean & standard deviation; computing Poisson probabilities, its applications * Hyper-geometric distribution and computing probabilities with. | Chapter 5  Ken Black |
| 4 | Continuous Distributions | 1 | * Normal distribution, standard normal distribution & their characteristics; solving normal curve problems * Uniform distribution and computation of its probability * exponential distribution & its characteristics; solving exponential probabilities; t, Chi-square and F distributions * applications | Chapter 6  Ken Black |
| 5 | Sampling & sampling distributions | 1 | * Its meaning and reasons; census, frame, random vs. non-random sampling * random sampling techniques: simple, stratified, systematic, cluster * non-random sampling techniques: convenience, judgment, quota, snowball techniques * Random number generator * sampling distribution of and p | Chapter 7  Ken Black |
| 6 | Estimation of Population Mean & Proportion | 1 | * Estimating population mean using z & t-statistics, estimating population proportion * Constructing of confidence interval for and p * Estimating sample size | Chapter 8  Ken Black |
| 7 | Hypothesis Testing for single population parameter | 2 | * Meaning of hypothesis testing and the process; type I and II errors * Testing hypothesis of population mean using z and t * Testing hypothesis of population proportion * Testing hypothesis about a variance | Chapter 9  Ken Black |
| 8 | Hypothesis Testing for differences in two means & proportions | 2 | * Hypothesis testing & confidence intervals about the difference in two means using z and t (independent) * Statistical inferences for two related populations * Statistical inferences about two population proportions | Chapter 9 and 10  Ken Black |
| 9 | Analysis of Variance & Design of Experiments | 2 | * Introduction to design of experiments * Completely randomized design * Multiple comparison tests * Randomized block design * Factorial design (2-way ANOVA) | Chapter 11  Ken Black |
| 10 | Analysis of Categorical Data | 1 | * Chi-square goodness of fit test * Contingency analysis | Chapter 12  Ken Black |
| 11 | Simple and Multiple Regression Modeling | 2 | * Equation of the simple regression line, estimation, residual analysis, coefficient of determination; hypothesis testing * Multiple regression model, estimation, significance, fitness, interpretation | Chapter 14 and 15  Ken Black |
| 12 | Non-parametric tests | 1 | * Wilcoxon matched-pairs signed rank test * Kruskal-Wallis test * Spearman’s rank correlation | Chapter 13  Ken Black |

**Essential things that every student should take attention on:**

1. Calculator and Laptop: Each student must compulsorily bring his own calculator and handouts in every session. Needs to bring the laptop as per the need of class. Install the program SPSS in your laptop in functional form.
2. Homework: After completion of each learning unit, homework from the respective learning unit will be provided to each students and it is mandatory to complete the given homework. The teacher will collect the homework after 7 days from the assigned date.
3. Attendance and punctuality. Attendance is mandatory in all classes. The instructor will record all times missed from class whether from absence, tardiness, or leaving class early for any reason. The maximum absences allowed with formal approval **20%** exceeding which you may not be allowed to sit for end semester examination. Late arrival or class bunking are not allowed; they will incur penalty.
4. Submission of assignment on due date. All assignments must be hand written and submitted in hardcopy. Late submission will attract penalty, including downgrading and zero grading, depending on how late it is submitted. **Assignments found copied (both, who gives to copy and who copies) will result in zero grading**.
5. Pre-session reading and preparation for session. You must come prepared for the planned learning activities failing which will result not only in appropriate academic sanctioning but, more importantly, in your inability to take benefit from the learning process that takes place in the class room setting and also losing of face among your own colleagues.
6. Active and constructive participation in the learning process. Passive presence will not only earn negative credit for you in your participation evaluation but also deny you opportunity to learn, contribute and build self-confidence. Contributions in the learning process should however be positive, productive, dignified and respectful while guided by the motivation of learning through personal involvement. Disrespectful and disturbing participation will earn negative credit.