

KINGDOM OF SAUDI ARABIA

King Saud University

Deanship of Common First Year

Department of Basic Sciences



المملكة العربية السعودية

جامعة الملك سعود

عمادة السنة الأولى المشتركة

قسم العلوم الأساسية

## Syllabus and Contents of Course for **First Semester 1445**

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| <b>COURSE NAME:</b> INTRODUCTION TO PROBABILITY AND STATISTICS.<br><b>COURSE NUMBER:</b> STAT 101   | <b>CREDIT HOURS:</b> 3 HOURS<br><b>ACTUAL HOURS:</b> 4 HOURS |
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| <b>Course Coordinator:</b> Prof. Dr. Hamid Al-Oklah<br><b>E-mail:</b> <a href="mailto:stat140@cfy.ksu.edu.sa">stat140@cfy.ksu.edu.sa</a>  | <b>Office:</b> 2469<br><b>Phone:</b> 94582                   |
| <b>Textbook:</b> Introduction to Probability and Statistics, Sixth Edition, 2022.<br><b>Authors:</b> Abouammoh A., Sultan K., Kayid M. and Sharahili M.   |  |
| <b>Some References:</b><br>1-Nicholas, Jackie. Introduction to Descriptive Statistics. Mathematics Learning Centre, University of Sydney, 1990.<br>2-Samules, M.L., Witmer, J.A and Schaffner, A., Statistics for the Life Sciences. Fourth edition, Pearson, New York, 2012.<br>3-Walpole, R.E., Myers, R.H. and Myers, S.L. and Ye, K., Probability and Statistics for Engineers and Scientists, Ninth Edition, Prentice, New York, 2012. |  |

### Goals: In this course

- The student will be able to understand some statistical concepts and use them.
- The student will be able to classify the variables and data into quantitative and qualitative.
- The student will be able to compute some measurements of central tendency, determine some position measurements and their representation on Box Plot diagram.
- The student will be able to compute some measurements of dispersion, determine some measurements which are used to compare the variation between two (or more) sets.
- The student will be able to determine the space of elementary events of some random experiment, compute the probability of events which depend on a random experiment, understand conditional probability, using the total probability formula and Bayes formula in probability calculation.
- The student will be able to understand the concept of the random variable and its probability distribution, types of the random variables, computing the mean and standard deviation of discrete random variable, the meaning of continuous random variable, understanding applications of uniform, exponential and normal distributions.
- The student will be able to understand the concept of the point and interval estimation for a parameter of population, determine the confidence interval for a parameter of population, understand the concept of the test hypothesis and perform tests for parametric hypotheses.
- The student will be able to calculate Pearson's simple linear correlation coefficient, determine the straight line regression (type Y on X) according to the least square method.

## Course Schedule and Contents:

| Chapter   | Week    | Required   | Examples     | Exercises for Students   |
|---|---------|--|--------------|--|
| -----   | Week 1  | <b>Induction Program</b>   | -----        | -----  |
| <b>Chapter One</b><br>DESCRIPTIVE<br>STATISTICS                                 | Week 2  | Explanation of the Crocker plan for the course<br><b>1.0- Introduction.</b><br><b>1.1- Basic Concepts and Definitions.</b>         | All examples | 1, 2, 3, 4, 5, 6-a, 7, 8-a, 9, 10, 11-a, 13-a-b, 25-a-b, 26-a-b, 27.                           |
|   | Week 3  | <b>1.2- Organizing the Data.</b><br><b>1.3- Graphical Representation of the Data.</b>  | All examples |  |
|   | Week 4  | <b>1.4- Measures of Central Tendency (Mean, Median and Mode).</b>  | All examples | 6-b-c, 8- b-c-d-e, 12-d-e, 13-c, 14, 15-a, 16, 17, 19, 20, 21, 22-a, 23-a, 25-c.               |
|   | Week 5  | <b>1.4- Measures of Central Tendency (Percentiles, Deciles, ... up to the end of this section).</b>                                | All examples |  |
|   | Week 6  | <b>1.5- Measures of dispersion, Coefficient of Variation and z-scores.</b>   | All Contents | 11-b, 12-a-b-c, 15--b-c, 18, 19, 22-b-c-d, 23-b-c-d, 24, 26-c.                                 |
| <b>Chapter Two</b><br>PROBABILITY   | Week 7  | <b>2.1- Mathematical Concepts.</b><br><b>2.2- Definitions and Concepts in Probability Calculus.</b>                                | All examples | 1, 2, 3, 4, 5, 6,  |
|   | Week 8  | <b>2.3- Concept of Probability Function.</b><br><b>2.4- Conditional Probability and Independence of Events.</b>                    | All examples | 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23.                               |
| <b>Chapter Three</b><br>RANDOM<br>VARIABLES<br>AND PROBABILITY<br>DISTRIBUTIONS | Week 9  | <b>3.1- Concept of Random Variables and Their Distributions.</b><br><b>3.2- Discrete Random Variables and Their Distributions.</b> | All examples | 1, 2, 5, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 28, 29, 30, 31.                     |
|   | Week 10 | <b>3.3- Continuous Random Variables and Their Distributions.</b>   | All examples | 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 32, 33, 34, 35, 36, 37.                                |
| <b>Chapter Four</b><br>INTRODUCTION<br>TO STATISTICAL<br>INFERENCE              | Week 11 | <b>4.1- Definitions and Concepts.</b><br><b>4.2- Estimation of the Population Mean.</b>  | All examples | 1, 2, 3, 4, 5, 6, 7, 10, 24-a, 26, 27, 28.   |
|   | Week 12 | <b>4.3- Estimation of the Population Proportion.</b><br><b>4.4- Introduction to Hypotheses Testing.</b>                            | All examples | 8, 9, 11, 12.  |
|   | Week 13 | <b>4.5- Hypotheses Testing for the Population Mean.</b><br><b>4.6- Hypotheses Testing for the Population Proportion.</b>           |              | 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24-b, 25.  |
| -----   | Week 14 | <b>Mid-semester break</b>  | -----        | -----  |
| <b>Chapter Five</b><br>CORRELATION<br>AND REGRESSION                            | Week 15 | <b>5.1- Linear Correlation Coefficient.</b>  | All examples | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26. |
|   | Week 16 | <b>5.2- Simple Linear Regression.</b>  | All examples |  |

**Note:** The trainer may suffice with one example in case that other examples have the same idea and leave the rest of the examples to the student as a self-study.

### Important Instructions:

- 1- Absence shall be counted from the first day until the last day preceding the final exams for the semester.
- 2- If the student delayed more than ten minutes of the lecture is absent, and if the presence during the first ten minutes register late.
- 3- The student is deprived of the final exam if the percentage of absenteeism exceeded **25%** of the hours of attendance approved for teaching.

- 4- The student is evaluated during the semester based on:
- a) Two paper home works, each with five degrees ( $5 + 5 = 10$ ),
  - b) Three electronic home works with a score of **10** degrees,
  - c) Discussions and activity with a score of **5** degrees
  - d) A midterm exam with a score of **25** degrees,
  - e) A final exam with a score of **50**.