



**University/Academy:** Arab Academy for Science, Technology and Maritime Transport  
**Faculty/Institute:** College of Computing & Information Technology  
**Program:** B. Sc. of Computer Science / Information Systems / Software Engineering

**Form No. (12)**  
**Course Specification**

**1- Course Data**

<b>Course Code:</b> BA203	<b>Course Title:</b> Probability & Statistics	<b>Academic Year/Level:</b> 2 / 3
<b>Specialization:</b> Basic & Applied Sciences	<b>No. of instructional units:</b> 3 <b>Lectures:</b> 2 <b>Tutorial :</b> 2	

**2- Course Aim**

This course provides an introduction to Statistical analysis and theory of probability without burdening the student with a great deal of measure theory. The course helps to build up the important Skills necessary for understanding, analyzing and solving problems

**3- Intended Learning Outcome (ILO's)**

**a- Knowledge and Understanding**

K14. Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.

(Equivalent to K12 in the IS dept & K13 in the SE dept)

- Define basic statistical concepts.
- Identify different statistical measures.
- express events using set theory.
- list probability theorems .
- recognizing conditional probability problems.
- identify independent and dependent events
- Recall Permutations and Combinations
- Relate to different types of enumeration method.
- recognizing Total probability – Bayes theorem problems.
- Discuss Discrete probability distribution.
- Express probability mass function and C.D.F.
- Identify Discrete random variables
- Discuss Continuous probability distribution.
- Express probability density function and C.D.F.
- Identify Continuous random variables.
- recall Mathematical expectation, mean and variance.
- Discuss various Special discrete distribution.

	<ul style="list-style-type: none"> <li>Recognize various Special discrete distribution.</li> <li>Discuss various Special continuous distribution.</li> <li>Recognize various Special continuous distribution.</li> <li>Discuss various Special continuous distribution</li> <li>Recognize various Special continuous distribution..</li> <li>.Discuss and recognize discrete joint probability distribution.</li> <li>Identify problems related to bivariate distributions</li> <li>Discuss and recognize continuous joint probability distribution.</li> <li>Identify problems related to bivariate distributions</li> </ul>
<b>b- Intellectual Skills</b>	<p>I2. Realize the concepts, principles, theories and practices behind computing and information as an academic discipline.</p> <ul style="list-style-type: none"> <li>Apply basic statistical concepts</li> <li>construct frequency distribution tables.</li> <li>calculate different statistical measures.</li> <li>use set theory and probability theorems.</li> <li>distinguish between different probability theorems</li> <li>Differentiate between independent and dependent event in various problems.</li> <li>distinguish between different probability theorems</li> <li>Use enumeration methods to calculate probability.</li> <li>apply Total probability – Bayes theorem</li> <li>distinguish between different probability theorems</li> <li>Calculate P.m.f and C.D.F.</li> <li>Calculate P.d.f and C.D.F.</li> <li>distinguish between discrete and continuous cases.</li> <li>calculate mathematical expectation, mean and variance.</li> <li>Solve problems base on various Special discrete distribution.</li> <li>Distinguish and differentiate between various Special discrete distribution..</li> <li>Solve problems base on various Special continuous distribution.</li> <li>Distinguish and differentiate between various Special continuous distribution..</li> <li>Solve problems base on various Special continuous distribution.</li> <li>Distinguish and differentiate between various Special continuous distribution.</li> <li>Solve discrete bivariate problems.</li> <li>Distinguish between independent and dependent R.Vs</li> <li>evaluate correlation coefficient.</li> <li>Solve continuous bivariate problems.</li> <li>Distinguish between independent and dependent R.Vs</li> <li>evaluate correlation coefficient.</li> </ul>
<b>c- Professional Skills</b>	<p>P8 Handle a mass of diverse data, assess risk and draw conclusions.</p> <ul style="list-style-type: none"> <li>Apply statistical measures in real life problems such as demography</li> <li>Simulate the behaviour of probability distributions in various applications</li> </ul>
<b>d- General Skills</b>	<p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <p>G3. Show the use of information-retrieval.</p> <p>G5. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.</p> <ul style="list-style-type: none"> <li>Present and defend solutions orally in front of professors and peers</li> </ul>

	<ul style="list-style-type: none"> <li>• Implement skills learned to undertake small-scale research problems</li> <li>• Develop basic understanding of methods of data collection and analysis</li> </ul>																																																			
<b>4- Course Content</b>	<table border="1"> <thead> <tr> <th colspan="3">Lecture</th> </tr> <tr> <th>Wk</th> <th>Hrs</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>An introduction to Statistics and statistical analysis on data observation</td> </tr> <tr> <td>2</td> <td>2</td> <td>Statistical measurements</td> </tr> <tr> <td>3</td> <td>2</td> <td>Elementary Probability- Probability theorems</td> </tr> <tr> <td>4</td> <td>2</td> <td>Conditional probability --Independent and dependent events</td> </tr> <tr> <td>5</td> <td>2</td> <td>Total probability rule – Baye’s Theorem and enumeration methods</td> </tr> <tr> <td>6</td> <td>2</td> <td>Discrete probability distribution – probability mass function</td> </tr> <tr> <td>7</td> <td>2</td> <td>Continuous probability distribution – probability density function</td> </tr> <tr> <td>8</td> <td>2</td> <td>Mathematical expectation, mean and variance</td> </tr> <tr> <td>9</td> <td>2</td> <td>Special discrete distribution: Bernoulli , Binomial, Hypergeometric and Poisson distributions</td> </tr> <tr> <td>10</td> <td>2</td> <td>Special continuous distribution: Uniform and exponential distribution</td> </tr> <tr> <td>11</td> <td>2</td> <td>Special continuous distribution: normal distribution</td> </tr> <tr> <td>12</td> <td>2</td> <td>12<sup>th</sup> week exam</td> </tr> <tr> <td>13</td> <td>2</td> <td>Discrete joint probability distribution</td> </tr> <tr> <td>14</td> <td>2</td> <td>Continuous joint probability distribution</td> </tr> <tr> <td>15</td> <td>2</td> <td>Final revision</td> </tr> </tbody> </table>	Lecture			Wk	Hrs	Description	1	2	An introduction to Statistics and statistical analysis on data observation	2	2	Statistical measurements	3	2	Elementary Probability- Probability theorems	4	2	Conditional probability --Independent and dependent events	5	2	Total probability rule – Baye’s Theorem and enumeration methods	6	2	Discrete probability distribution – probability mass function	7	2	Continuous probability distribution – probability density function	8	2	Mathematical expectation, mean and variance	9	2	Special discrete distribution: Bernoulli , Binomial, Hypergeometric and Poisson distributions	10	2	Special continuous distribution: Uniform and exponential distribution	11	2	Special continuous distribution: normal distribution	12	2	12 <sup>th</sup> week exam	13	2	Discrete joint probability distribution	14	2	Continuous joint probability distribution	15	2	Final revision
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<b>5- Teaching and Learning Methods</b>	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Tutorials</li> <li>3. Individual and group course homework</li> </ol>																																																			
<b>6- Teaching and Learning Methods for Students with Special Needs</b>	<ul style="list-style-type: none"> <li>• Students with special needs are requested to contact the college representative for special needs ( currently Dr Hoda Mamdouh in room C504)</li> <li>• Consulting with lecturer during office hours.</li> <li>• Consulting with teaching assistant during office hours.</li> <li>• Private Sessions for redelivering the lecture contents.</li> <li>• For handicapped accessibility, please refer to program specification.</li> </ul>																																																			
<b>7- Student Assessment</b>																																																				
<b>a- Procedures used:</b>	<ol style="list-style-type: none"> <li>1. Written examinations to assess the Intended learning outcomes.</li> <li>2. Continuous assessment (reports, discussions, etc.....) to assess the Intellectual skills.</li> </ol>																																																			

<b>b- Schedule:</b>	Assessment 1: 7 <sup>th</sup> Week Written Exam Assessment 2: 12 <sup>th</sup> Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16 <sup>th</sup> Week Final Written Exam
<b>c- Weighing of Assessment:</b>	7 <sup>th</sup> Week Examination : 30 % 12 <sup>th</sup> Week Examination: 20 % Final-term Examination: 40 % Semester Work : 10 % Total : 100%
<b>8- List of References:</b>	Feller, W (1968) An introduction to probability theory and its applications val 13 <sup>th</sup> ed John Wiley, New York Ross, S.M. York Ross S.M (1989) Introduction to probability models (4 the dm ) Academic press, Orlando
<b>a- Course Notes</b>	
<b>b- Required Books (Textbooks)</b>	Probability & statistics for Engineers and Scientists, ninth edition, by Walpole/ Myers / Myers and Ye.
<b>c- Recommended Books</b>	
<b>d- Periodicals, Web Sites, ..., etc.</b>	

**Course Instructor**

Name:

Signature:

**Head of Department**

Name: **Dr. Samah Senbel**

Signature: