

**Jordan University of Science and Technology**  
**Faculty of Veterinary Medicine**  
**Department of Pathology and Animal Health**  
**Second Semester 2006-2007**

| <b>Course Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                               |
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| <b>Course Title</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Biostatistics                                                                                                                 |
| <b>Course Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | VM 711                                                                                                                        |
| <b>Prerequisites</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | None                                                                                                                          |
| <b>Course Website</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                               |
| <b>Instructor</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Prof. Shawkat Q. Lafi (Hailat) or Dr. Labib Shareef                                                                           |
| <b>Office Location</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | G2 Level 1                                                                                                                    |
| <b>Office Phone</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 22029 or 22019                                                                                                                |
| <b>Office Hours</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Mon-Thur. 8-9 am and 12-1 pm                                                                                                  |
| <b>E-mail</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <a href="mailto:shqalafi@just.edu.jo">shqalafi@just.edu.jo</a> ; <a href="mailto:shareef@just.edu.jo">shareef@just.edu.jo</a> |
| <b>Teaching Assistant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | None                                                                                                                          |
| <b>Course Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                               |
| <p>This course is designed to teach students how to</p> <ol style="list-style-type: none"> <li>1. Collect, classify, summarize and present data.</li> <li>2. Make essential statistical analysis on the mean of one, two and more than two samples.</li> <li>3. Make essential statistical analysis on the proportion (rate) of one and two samples.</li> <li>4. Make essential statistical analysis on categorical data.</li> <li>5. Draw scientific conclusion from sample(s).</li> </ol> |                                                                                                                               |

| <b>Text Book</b>    |                                                                                                                                                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Title</b>        | <p><b>Statistics with Applications to the Biological &amp; Health Sciences. By Remington &amp; Schork.</b><br/> <b>Biostatistics: A foundation for Analysis in the Health Sciences. By W. Daniel, 1999.</b></p> |
| <b>Author(s)</b>    | Remington & Schork                                                                                                                                                                                              |
| <b>Publisher</b>    | prentics                                                                                                                                                                                                        |
| <b>Year</b>         | 1985                                                                                                                                                                                                            |
| <b>Edition</b>      | Second                                                                                                                                                                                                          |
| <b>Book Website</b> |                                                                                                                                                                                                                 |
| <b>References</b>   | <b>Biostatistics: A foundation for Analysis in the Health Sciences. By W. Daniel, 1999.</b>                                                                                                                     |

| <b>Assessment Policy</b> |                          |               |
|--------------------------|--------------------------|---------------|
| <b>Assessment Type</b>   | <b>Expected Due Date</b> | <b>Weight</b> |
| <b>First Exam</b>        | March 22, 2007           | 25%           |
| <b>Second Exam</b>       | April 19, 2007           | 25%           |
| <b>Final Exam</b>        | June, 2007               | 50%           |
| <b>Assignments</b>       | none                     |               |

| Course Objectives                                                                         | Weights |
|-------------------------------------------------------------------------------------------|---------|
| 1. Collect, classify, summarize and present data.                                         | 10%     |
| 2. Make essential statistical analysis on the mean of one, two and more than two samples. | 30%     |
| 3. Make essential statistical analysis on the proportion (rate) of one and two samples.   | 20%     |
| 4. Make essential statistical analysis on categorical data.                               | 20%     |
| 5. Draw scientific conclusion from sample(s).                                             | 20%     |

| Teaching & Learning Methods |
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| Learning Outcomes: Upon successful completion of this course, students will be able to |                                                                                                                                                                                                                                                                                                                                   |              |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Related Objective(s)                                                                   |                                                                                                                                                                                                                                                                                                                                   | Reference(s) |
| 1                                                                                      | <b>Introduction:</b> Definition of Biostatistics, Types of variables. Population and sample. Studying Sample versus Population                                                                                                                                                                                                    | Text book    |
| 1                                                                                      | <b>Descriptive Statistics</b><br>Measures of Central Tendency:<br>Arithmetic mean, median and mode.<br>Geometric mean and Weighted mean.                                                                                                                                                                                          | Text book    |
| 1                                                                                      | <b>Measures of Variability:</b><br>Range, variance, standard deviation and coefficient of variation.                                                                                                                                                                                                                              | Text book    |
| 1                                                                                      | <b>Grouped Data and Frequency Table:</b> Histogram, polygon and cumulative frequency polygon.<br>percentile and percentile rank. Mean, median and standard deviation for grouped data.                                                                                                                                            | Text book    |
| 2                                                                                      | <b>Probability:</b> Definitions, Addition Rules, Multiplication Rules, Dependant and independent variables, Sensitivity and specificity of a screening test<br>Predictive positive rate False positive and False negative rates                                                                                                   | Text book    |
| 2                                                                                      | <b>Normal:</b> Z- distribution and t- distribution, Binomial distribution                                                                                                                                                                                                                                                         | Text book    |
| 3                                                                                      | <b>Estimation: A- Normal Distribution,</b> Confidence interval for a population mean Confidence interval for the difference between two population means products<br><b>B- Binomial Distribution:</b> Confidence interval for a population proportion, Confidence interval for the difference between two Population proportions, | Text book    |

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|   | Re-view questions.                                                                                                                                                                    |           |
| 4 | <b>Hypothesis Testing:</b> Null Hypothesis and alternative Hypothesis, Rejection region and acceptance region, Level of significance (P-value) Z and t-tests for one population mean. | Text book |
| 5 | <b>Hypothesis Testing:</b> B-Two populations' means ;Independent, Dependent                                                                                                           | Text book |
| 5 | <b>Hypothesis Testing:</b> Z-test for Binomial Distribution: One population proportion Two populations proportions Review questions                                                   | Text book |
| 5 | <b>Hypothesis Testing:</b> Chi-Square Test, Contingency table 2x2 tables, Statistical decision                                                                                        | Text book |

### Useful Resources

Previous statistical Knowledge or operating a statistical computer package such as SAS or SPSS would be useful for the student.

| Week    | Topics                                                                                                                                                                                                                          | Chapter in Text (handouts) |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| 1       | <b>Introduction:</b> Definition of Biostatistics, Types of variables. Population and sample.<br>Studying Sample versus Population                                                                                               | Text book Chapter 1        |
| 2       | <b>Descriptive Statistics</b><br>Measures of Central Tendency:<br>Arithmetic mean, median and mode. Geometric mean and Weighted mean.                                                                                           | Text book Chapter 2        |
| 3       | <b>Measures of Variability:</b><br>Range, variance, standard deviation and coefficient of variation.                                                                                                                            | Text book Chapter 2        |
| 4       | <b>Grouped Data and Frequency Table:</b><br>Histogram, polygon and cumulative frequency polygon. percentile and percentile rank. Mean, median and standard deviation for grouped data.                                          | Text book Chapter 2        |
| 5&6     | <b>Probability:</b> Definitions, Addition Rules, Multiplication Rules, Dependant and independent variables, Sensitivity and specificity of a screening test<br>Predictive positive rate False positive and False negative rates | Text book Chapter 3        |
| 7       | <b>Normal:</b> Z- distribution and t- distribution,. Binomial distribution                                                                                                                                                      | Text book Chapter 5        |
| 8&9 &10 | <b>Estimation: A- Normal Distribution,</b><br>Confidence interval for a population mean                                                                                                                                         | Text book Chapter 6        |

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|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
|       | Confidence interval for the difference between two population means products<br><b>B- Binomial Distribution:</b> Confidence interval for a population proportion, Confidence interval for the difference between two Population proportions, Re-view questions. |                     |
| 11    | <b>Hypothesis Testing:</b> Null Hypothesis and alternative Hypothesis, Rejection region and acceptance region, Level of significance (P-value) Z and t-tests for one population mean.                                                                           | Text book Chapter 7 |
| 12    | <b>Hypothesis Testing:</b> B-Two populations' means ;Independent, Dependent                                                                                                                                                                                     | Text book Chapter 7 |
| 13&14 | <b>Hypothesis Testing:</b> Z-test for Binomial Distribution: One population proportion Two populations proportions Review questions                                                                                                                             | Text book Chapter 7 |
| 15    | <b>Hypothesis Testing:</b> Chi-Square Test, Contingency table 2x2 tables, Statistical decision                                                                                                                                                                  | Text book Chapter 8 |

| Additional Notes     |                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------|
| <b>Assignments</b>   | None                                                                                                   |
| <b>Exams</b>         | None                                                                                                   |
| <b>Cheating</b>      | Will be Handled accordingly                                                                            |
| <b>Attendance</b>    | No less than 90% of the lectures                                                                       |
| <b>Workload</b>      | Moderate to high                                                                                       |
| <b>Graded Exams</b>  | First, Second and Final                                                                                |
| <b>Participation</b> | 5% of the total grade would be for attendance and participation which will be added to the second exam |
| <b>Laboratory</b>    | none                                                                                                   |
| <b>Projects</b>      | none                                                                                                   |