

**Akita International University**  
**MAT200 STATISTICS (3 credits)**  
**Fall '2009**

Instructor: Marcin SCHROEDER

Office hours: TBA

Office: A-3-7

e-mail: [mjs@aiu.ac.jp](mailto:mjs@aiu.ac.jp)

Phone: 886-5984

Semesters: Spring, Fall

Meeting times: T, R 12:30-13:45

Classroom: D102

**DESCRIPTION:** This is an introductory college level course in statistics with an emphasis on the practical applications and on the use of statistical software. The course is designed to provide students with general understanding of statistical methods, but without direct reference to the elements of the formalism that require knowledge of calculus. The material of the course includes all standard topics necessary for subsequent education in more advanced courses in statistics. Students learn wide range of methods of the descriptive and inferential statistics necessary to carry on basic research. The topics in descriptive statistics include frequency distributions, data display, the measures of central tendency and of variability of data, linear correlation and regression in one dimension. In inferential statistics: sampling distributions, z-tests, t-tests, introduction to ANOVA, chi-square tests and other non-parametric methods.

**OBJECTIVES:** This course has two sets of objectives related to its two complementary functions in the curriculum. It provides students with the knowledge and skills necessary for subsequent courses in statistics or courses which use statistical methods for the analysis of data. Thus, students who will elect Global Business Program have to complete Statistics as a required course, preparing them for business related courses that directly use the concepts or methods of statistics, or which require competence in data analysis.

The second function of this course is relevant for all students, no matter what is or will be their choice of Advanced Education at AIU or professional career. Statistics is a course in which students can develop skills and competencies that belong to the Liberal Arts education, such as the ability to make decisions based on limited available information. In particular, upon successful completion of the course, students should be able to design and carry on a basic quantitative or qualitative research in an arbitrary discipline that requires statistical methods of collecting data and their analysis.

**STUDY MATERIALS:**

<Textbook> Robert S. Witte/John S. Witte, STATISTICS, 8<sup>th</sup> ed. Willey & Sons.

ISBN-10: 0-471-72229-4, ISBN-13: 978-0-471-72229-8. The textbook can be purchased at the

Bookstore.

**<Reference books, sources of readings and other information>** In order to adjust the material of the textbook to the objectives of the course it may be necessary to use some additional materials distributed in the class in the form of handouts.

Students interested in expanding their perspectives on the subject of the course, or on mathematics in general, should ask the instructor for advice on additional, optional readings.

Calculator with all arithmetical functions (including the square root function) will be necessary. Students may and should use calculators in class or during tests. Software for computer assignments will be available in the computer lab without any cost.

**ASSESSMENT:** Student achievement of the course objectives is being measured in terms of student performance in completing homework assignments (20%,) computer lab assignments (20%,) solving problems on the Midterm Test (20%,) and on the comprehensive Final Examination (40%).

Each day of the classes students will get homework assignment consisting of a selection of problems related to the material covered in the class. The solutions of assigned problems should be turned in before or during next class meeting. Each time only one out of all assigned problems will be graded. Also, (in the later part of the course) students will get assignments to be done with the use of statistical computer software.

In the evaluation of homework assignments and tests, the emphasis is on the correct application of methods studied in the course and on the evidence for their good understanding.

**ACADEMIC PREPARATION:** There is no expected academic work at the college level preparing for the course. Good high school background in mathematics will make studying in this course easier, but even students who went through high school mathematical education with difficulties can complete the course with a good grade, provided they attend classes regularly, complete all assignments in timely manner, and put in the study no less effort than in other courses. The expectations regarding (English) language are not going beyond the requirements for the entry into Basic Education. However, much more extensive readings in the textbooks and handouts require higher level of language proficiency than in College Algebra.

**POLICIES:** Acts of cheating or other forms academic dishonesty will be dealt with harshly. Students may work together on their computer assignments, but every student must prepare individually and without help of others his/her report. Copying someone's report is considered an act of cheating.



- Assignment: p.190#8.12; 8.14.
- 10) **9** Sampling Distribution of the Mean pp. 193-206  
Assignment: p.206#9.7; 9.8; 9.10.  
END OF THE MATERIAL FOR THE MIDTERM TEST
- 11) **10** Introduction to Hypothesis Testing: The z Test. pp. 209-221  
Assignment: p.221#10.6, 10.8
- 12) **11** More about Hypothesis Testing pp. 225-248  
Assignment: p.249#11.10; 11.12; 11.14
- 13) MIDTERM TEST
- 14) **12** Estimation (Confidence Intervals) pp. 253-264  
Assignment:p.264#12.6; 12.9.
- 15) Introduction to Statistical Software
- 16) **13** t-Test for One Sample pp. 267-278  
p.278#13.5; 13.7.
- 17) **14** t-Test for Two Independent Samples pp.281-305  
Assignment: p.305#14.10; 14.13.
- 18) **15** t-Test for Two Related Samples (Repeated Measures) pp. 309-326  
Assignment: p. 326#15.7; 15.10.
- 19) Review of t-Test and Introduction to ANOVA
- 20) **16** Analysis of Variance (One Factor) pp.331-360  
Assignment: p.360#16.10; 16:12.
- 21) **17** Analysis of Variance (Repeated Measures) pp. 365-381  
Assignment: p. 394#17.5; 17.6.
- 22) **18** Analysis of Variance (Two factors) pp. 385-409.  
Assignment: p. 410#18.9; 18.10.
- 23) **19** Chi-Square Test for Qualitative (Nominal) Data pp. 415-423  
Assignment p.433#19.8;
- 24) **19.** Chi-Square Test for Qualitative (Nominal) Data pp. 423-433  
Assignment: p.435#19.12
- 25) **20** Test for Ranked Data pp. 439-445 (IF TIME PERMITS!)  
Assignment: p. 444#20.2
- 26) Student Presentations
- 27) and 28) Review Sessions
- 29) TBA **FINAL EXAMINATION**