

L1022 Statistics for Economists REVISION SESSION

General points and tips:

1. check with the official exams timetable the date, time and place of the statistics exam – do not rely on friends or me to tell you.
2. In the exam hall you will be given a set of statistical tables and a formula sheet. Copies of these for you to use when revising are available on Study Direct. Use these so that you are familiar with the format of the tables that you will use in the exam: different text-books use different formats which can lead to confusion.
3. The exam will be 2 hours long: you must attempt Q1 from Section A and then 2 questions out of 3 from section B.

Section A is compulsory and is worth 30 marks. It has 3 or 4 distinct parts covering summary statistics, correlation, probability, etc.

Section B has 3 questions, you must choose TWO of these. Each is worth 35 marks, and cover confidence intervals, hypothesis testing, correlation and regression, ANOVA, etc.

4. You can use a calculator in the exam – check with the exams office about permitted models. A strict invigilator will remove your calculator if it is not on the approved list. Take a spare battery.
5. If a question asks you to conduct a hypothesis test but does not specify the significance level, use a 5% significance level.
6. Remember to interpret your answer – comment on what your results tell you, e.g. explain in words the conclusion of your hypothesis test etc.
7. You may find it useful to sketch the probability distributions that you are using for hypothesis tests, e.g. sketch a normal distribution, mark on the critical value(s) and the value of your test-statistic. It can help to avoid confusion, and also shows the examiners you know what you are doing even if you may have made a mistake in a calculation.
8. Past papers are available, use them to practise answering questions. It might help to identify all the past questions from different exam papers on a particular topic and work through them once you had done some revision from your lecture notes, the text-book and seminar exercises. Gradually build up from answering them with the help of your notes to being able to answer them on your own, and quickly.
9. All the material needed for the exam is in the lecture slides and class exercises posted online on Study Direct.
10. Sometimes, if you are asked to calculate something, like a correlation coefficient, you will be asked to show that the answer is "x". If you are running short on time, or get the wrong answer and can't see where you have gone wrong, assume the correct answer is the one on the paper and use that for any further calculations such as hypothesis tests. Please do not waste 30 mins trying to

calculate something that is only worth 5 marks.

11. Follow the steps for hypothesis testing that we have used throughout the Statistics course:
 - Write down the null hypothesis and the alternative (the null usually contains an equal sign)
 - Decide which probability distribution you need to use [what are you testing? how big is the sample?] and look up the critical value(s) from the tables. Sketch these on a graph.
 - Calculate the test-statistic
 - Compare the test-statistic with the critical value(s) and decide if you are rejecting or not rejecting the null hypothesis. Explain what this means.

12. Don't get too distracted by the wording of a question. Just think of the numbers – sample 1 of size n and mean \bar{x} etc.

13. Finally, two hours is not very long. You will need to work fast and accurately, so practise as much as you can beforehand.

TOPICS TO BE REVISED		
	Topic	Techniques
1	Summarising data	Mean, median, mode, standard deviation, variance, plotting graphs, z-scores, chebyshev's rule
2	Probability	Simple probability concepts; probability distributions (Normal, t, F, Chi-squared)
3	Confidence intervals	Constructing and interpreting confidence intervals for <ul style="list-style-type: none"> ▪ means and proportions ▪ differences between means and proportions. Remember when to use t (small samples, $n < 25$) and when to use normal distribution (large samples, $n > 25$). ▪ Variances (using the chi-squared distribution)
4	Hypothesis testing	Testing hypotheses about: <ul style="list-style-type: none"> ▪ the mean and proportion from a single sample (t or z) ▪ differences between two means and two proportions (t or z) from different samples, independent and matched/paired samples ▪ differences between variances (F-test) ▪ comparing actual and expected values (chi-squared) ▪ contingency tables (chi-squared) ▪ analysis of variance (F-test)
5	Correlation	Calculation, interpretation and significance testing of the Pearson correlation coefficient and of the Spearman rank
6	Regression	Interpretation of OLS regression output from Excel: <ul style="list-style-type: none"> ▪ regression coefficients, their standard errors and t-statistics and p-values; pay particular attention to units of variables. ▪ test the individual significance of the regression coefficients. ▪ how to use regression coefficients to calculate elasticities. ▪ interpretation of R^2 and F-test of the overall significance of the regression

Changes to course content

The syllabus has changed from past years: three big changes:

- a) we have dropped some of the material on descriptive statistics such as the Gini coefficient and Lorenz curves.
- b) we also dropped most of the probability content. Pre 2006 students had to learn the binomial and poisson probability distributions, joint and conditional probability and Bayes theorem. Now you just need to know t, Normal, F and Chi-squared.
- c) For one year we dropped hypothesis testing about parameters from two populations: ie differences in means and proportions, so there is one year when the exam paper only asks for hypo tests about a single parameter.
- d) the course was moved from year 1 to year 2/3 so there is no exam paper for 2004.
- e) Finally, the emphasis has gradually evolved from pure number-crunching to interpretation so expect to have to explain, interpret and comment on your answers.

Good luck!