The University of New South Wales School of Economics

ECON2215 Statistics for Econometrics

Lecturer: Dr. Rachida Ouysse Room: JG 106 Tel: 9385 3321 E-mail: rouysse@unsw.edu.au

Lecture: Friday 9-11am JG LG21 Tutorial: Friday 11-12noon JG LG21

Consultation: Thursday 2-4.30pm

Session 1, 2005

Course Objectives

The aim of this course is to give you a solid foundation in mathematical probability theory and statistics. This is not only valuable in itself; it is also a prerequisite for intermediate and advanced undergraduate studies in econometrics. A side objective is to practice rigorous mathematical reasoning and to enhance your analytical skills.

Course Contents

The mathematical content of the course is large. We will cover is some detail distribution theory, expectations and moments, some special distributions such as the normal, χ^2 , *t*, *F*, and multivariate normal, basic asymptotic theory, estimation theory, the theory of hypothesis testing, and more.

Textbook

The required textbook for this course is:

Miller, I. and M. Miller (2004), *John S. Freund's Mathematical Statistics*, Seventh edition, Pearson Prentice Hall.

This book is denoted by "MM" in the lecture outline below. Additional readings will be indicated during the lectures. Students are responsible for all assigned readings. A couple of recommended reference books are as follows:

DeGroot, M.H. (1986), Probability and Statistics, 2nd. Ed. Reading, Mass.: Addison-Wesley

Hogg, R. V. and A. T. Craig, (1978), Introduction to Mathematical Statistics 4^{th} ed. New York: Macmillan.

Workload Expectations

It is expected that you will spend at least ten hours per week studying this course. This time should be made up of reading, research, working on exercises and attending classes. In periods where you need to complete assignments or prepare for examinations the workload may be greater. Over commitment has been a cause of failure for many students. You should take the required workload into account when planning how to balance study with employment and other activities.

Assessment

Assessment will be on the basis of tutorial work, tutorial assignments, a mid-session examination, and end-of-session examination, with the following weights:

| Tutorial assignments | 20% |
|---------------------------|-----|
| Mid-Session Examination | 30% |
| End-ofSession Examination | 50% |

Tutorials

Tutorials commence in week 2. The purpose of tutorials is to enable students to raise questions about difficult topics or problems encountered in their studies. *Students must not expect another lecture, but must come prepared with questions of their own.*

To facilitate this, a set of exercises is assigned each week. **Students should attempt all of them.** Students will not gain a proper understanding of the topics unless they master these assignments. (The tutorial exercises will give a good indication of the kind of questions that can be expected in examinations.)

Answers to tutorial assignments will be collected from students without warning. Four tutorial assignments (5% weight each) will count towards 20% of your overall mark for the subject. Hence, you should come to each tutorial with your attempted answers neatly prepared in case the assignment is collected during that tutorial. More than four assignments may be collected during the session, but only four will count towards your overall mark.

Students are encouraged to collaborate on these assignments. However, the presentation should be done individually. Identically presented answers will be given a mark equal to (raw mark)/(total number of identically presented assignments).

Mid-Session Examination

There will be a two-hour mid –session examination on **Friday 13 May.** This examination will be held during the regular lecture time. Subject material from weeks 1-7, inclusive, will be examined.

Special Consideration: Illness and Misadventure

If you believe that your performance in a subject, either during session or in an examination, has been adversely affected by illness or for any other reason, you should notify the Registrar and ask for special consideration I the determination of your results.

Requests for special consideration must be accompanied by appropriate documentation. They should be made as soon as practicable after the problem occurs. Application made more than seven days after the final examination in a subject will only be considered in exceptional circumstances. Special consideration request forms and details of required documentation are available from the Student Center (NewSouthQ) in the Chancellery, or through the UNSW web site (my.unsw.edu.au)

Students should be aware that lodgment of a request for special consideration does not guarantee the granting of a supplementary examination. This will only be recommended by the school of Economics for students whose final examination performance has been affected by serious illness or other extraordinary circumstances which can be documented AND if there is evidence on the basis of performance during the session that the student has made satisfactory progress.

Consultation

Students are encouraged to ask questions related to this subject during lectures when time permits, and especially during tutorials. The lecturer is available **Thursdays 2-4.30pm**, **JG106** for further consultations. Other consultation hours are possible by appointment.

Academic Misconduct

Students are reminded that the University regards academic misconduct as a very serious matter. Students found guilty of academic misconduct are usually excluded from the University for two years. Because of the circumstances in individual cases the period of exclusion can range from one session to permanent exclusion from the University.

The following are some of the actions, which have resulted in students being found guilty of academic misconduct in recent years:

- 1. Taking unauthorized materials into examination.
- 2. Submitting work for assessment knowing it to be the work of another person.
- 3. Improperly obtaining prior knowledge of an examination paper and using that knowledge in the examination.
- 4. Failing to acknowledge the source of material in an assignment.

Students should refer to the UNSW Undergraduate Handbook 2005. This gives further details on behaviour, which is unacceptable, and the penalties incurred for inappropriate conduct.

Students Support Services

Education Development Unit

Additional learning support, tailored to the needs of FCE students, is available from the Education Development Unit (EDU) in the Faculty. The EDU offers a range of services for FCE students including:

o Academic skills workshops run throughout the session;

- o Printed and on-line study skills resources e.g. referencing guide, report writing and exam preparation;
- o A drop-in resource centre containing books and audio visual material that can be borrowed;
- o A limited consultation service for students with individual or small group learning needs.

More information about the EDU services including on-line resources, workshop details and consultation request forms are available from the EDU website.

Contacts and location:

EDU Web: http://education.fce.unsw.edu.au

EDU Location: Room 2039, Level 2 Quadrangle Building

EDU services are free and confidential and are available to students of the Faculty of Commerce and Economics.

Other UNSW support

In addition to the EDU services, the UNSW Learning Centre provides academic skills support services for students. The Learning Centre is located on Level 2 of the Library and can be contacted by Phone: 9385 3890 or through their website: http://www.lc.unsw.edu.au/. Students experiencing problems of an academic or personal nature are encouraged to contact the Counselling Service at UNSW. This service is free and confidential and run by professional counsellors. The Counselling Service is located on Level 2, Quadrangle East Wing, and can be contact on 9385 5418.

Approximate Lecture Outline

| Week | Date | Topics | Readings |
|------|--------------|-----------------------------------|---|
| 1 | March 4 | Probability | MM Chap. 2 |
| | Manah 11 | Duch - 1:1:4- Distributions 6 | MM Char 2 |
| 2 | March 11 | Probability Distributions & | MIVI Chap. 3 |
| 3 | March 18 | Mathematical Expectation | MM Chan A |
| 5 | Iviai cii 10 | Mathematical Expectation | Wivi Chap. 4 |
| 4 | March 25 | | |
| 4 | March 25 | Holiday and Mid-session Recess | |
| 5 | April 1 | | |
| 6 | April 8 | Special Probability Distributions | MM Chap. 5 |
| | _ | | Excluding: Sections 5.5, 5.6, 5.9 |
| 7 | April 15 | Special Probability Densities | MM Chap. 6 |
| | | | Excluding: Sections 6.4, 6.6 |
| 8 | April 29 | Functions of Random Variables | MM Chap. 7 |
| 9 | May 6 | Sampling Distributions | MM Chap. 8 |
| | 5 | 1 5 | Excluding: Sections 8.3 |
| 10 | May 13 | MID-SESSION EXAMINATION | |
| | | In Class, 9:10-11:10am | |
| 11 | May 20 | Point Estimation | MM Chap. 10 |
| 12 | May 27 | Interval Estimation | MM Chap 11 |
| 12 | Way 27 | Interval Estimation | Excluding: Sections 11.4 11.5 11.7 11.8 |
| 12 | Juna 3 | Hypothesis Testing | MM Chap. 12& 13 |
| 15 | June 5 | Trypotnesis resting | Wivi Chap. 12& 15 |
| 14 | June 10 | Regression and Correlation | MM Chap. 14 |
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School of Economics, UNSW ECON2215 Statistics for Econometrics Session 1, 2005

Dr. Rachida Ouysse

Tutorials

This handout contains **tentative** tutorial assignments for the session. It is possible that changes will be required later.

Tutorial Assignments

A set of exercises is assigned each week. Students should attempt all of them. Students will not gain a proper understanding of the topics unless they master these assignments. The tutorial exercises will give a good indication of the kind of questions that can be expected in examinations.

The numbers in the table over the page refer to the exercises and Applied Exercises in the textbook. **Hand in written solutions to problems marked "*"**. We will discuss as many of the remaining problems as we have time for in class, with a priority to questions **not** marked "x"(for extra).

Answers to tutorial assignments will be collected from students without warning. Four tutorial assignments (5% weight each) will count towards 20% of your overall mark for the subject. Hence, you should come to each tutorial with your attempted answers neatly prepared in case the assignment is collected during that tutorial. More than four assignments may be collected during the session, but only four will count towards your overall mark.

Students are encouraged to collaborate on these assignments. However, the presentation should be done individually. Identically presented answers will be given a mark equal to (raw mark)/(total number of identically presented assignments).

Textbook

Miller, I. and M. Miller (2004), *John S. Freund's Mathematical Statistics*, Seventh edition, Pearson Prentice Hall

| Due | Exercises |
|----------|---|
| Week 2 | *2.5, *2.7, *2.17, 2.44, *2.52, *2.76, *2.89, *2.100, *2.110, *2.112, |
| | 2.15, 2.22, 2.23, 2.50, 2.58, 2.94, 2.98, 2.106; x2.6, x2.16, x2.24, x2.41, |
| | x2.54, x2.57, x2.102 |
| Week 3 | *2 15 *2 22 *2 44 *2 47 *2 102 |
| | 3.12, 3.20, 3.21, 3.24, 3.46, 3.49, 3.76, 3.79, 3.85, 3.106 |
| | x3.11, x3.13, x3.23, x3.54, x3.86 |
| Week 4-5 | None: Session break |
| Week 6 | |
| | *4.7, *4.24, *4.30, *4.33, *4.37, *4.61, *4.63, *4.73 |
| | 4.2, 4.4, 4.6, 4.10, 4.16, 4.19, 4.29, 4.36, 4.39, 4.44, 4.51, 4.57, 4.69 |
| Week 7 | *5 77 *5 79 *5 11 95 51 *5 71 *5 79 *5 95 |
| | 5.35, 5.36, 5.44, 63.34, 53.74, 57.76, 53.65 |
| | Hint for 5.3: Use Theorem 4.9 instead of Maclaurin series |
| Week 8 | |
| | *6.16, *6.21, *6.23, *6.37, *6.43, *6.52, *6.66, *6.70 |
| | 6.7, x6.2, x6.11, x6.20, x6.22, x6.33, x6.44, x6.53 |
| Week 9 | *7 / *7 7 *7 3/ *7 35 *7 /6 *7 63 |
| | 7.2, 7.44, 7.47, x7.3, x7.14, x7.19, x7.17, x7.36, x7.41, 7.50, x7.51 |
| | |
| Week 10 | None: MID-SESSION EXAM |
| Week 11 | |
| | *8.3, *8.18, *8.19, *8.22, *8.63, *8.75 |
| Week 12 | 8.2, 8.4, 8.5, 8.21, 8.23, 8.24, 8.25, 8.26, 8.61 |
| WEEK 12 | *8 38 *8 45 *8 46 *8 79 *8 81 *8 91 *8 93 *10 10 *10 17 |
| | 8.36, 8.39, 8.43, 8.78, 8.80, 8.86, 10.2, 10.4, 10.6 |
| | x8.37, x8.40, x8.50, x8.51, x8.52, x8.53, x10.3, x10.7, x10.13 |
| Week 13 | |
| | *10.35, *10.55, *10.69, *11.31, *11.33, *11.54 |
| | 10.31, 10.41, 10.51, 10.61, 10.65, 10.81, 10.84, 10.96, 11.1, 11.2, 11.6, |
| Week 14 | 11.20 |
| | *12.6, *12.12, *12.21, *12.34, *13.25, *13.26, *13.36, *13.37, *13.49 |
| | 12.1, 12.4, 12.7, 12.8, 12.15, 12.27, 12.40, 13.19, 13.20, 13.27, 13.44, |
| | 13.48 |