

MACQUARIE
UNIVERSITY



FACULTY OF
SCIENCE

STAT175
Gambling, Sport and Medicine

Semester 2, 2012

Department of Statistics

Unit convenor: Kj Byun

**MACQUARIE UNIVERSITY
FACULTY OF SCIENCE
UNIT OUTLINE**

Year and Semester: 2012, Second semester

Unit Convenor: Kj Byun

Prerequisites/ Corequisites: None/ None

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult the teaching staff in the unit.

ABOUT THIS UNIT

- STAT175 is a general 3 credit point education unit, recommended for students in all fields of study. There are no prerequisites or assumed background knowledge.
- The unit gives you an opportunity to investigate three interesting areas where statistics plays an important role: games of chance and gambling, sporting performance and medical studies. At the same time, you will be introduced to a range of statistical ideas and methods that will be useful in many other areas, professionally and personally.

TEACHING STAFF

Ms Kj Byun: room E4A 509, phone 9850 7473, e-mail kj.byun@mq.edu.au

Formal consultation times will be posted on the website and on our office doors.



CLASSES

You will have one 3-hour lecture, and you will be enrolled in one 1-hour laboratory class:

- Lectures: Monday 1-4 pm C5C T1 theatre
- Labs: Tuesday 2 pm (E4B 102), 3 pm (E4B 102), 4 pm (E4B 102 and 306),
Wednesday 2 pm (E4B 102 and E4B 206), 3 pm (E4B 102 and E4B 206),
4 pm (E4B 206) – all labs start in week 2

The timetable for classes can be found on the University web site at:

<http://www.timetables.mq.edu.au/>

We recommend that you attend all the lectures and all the labs.

Attendance at the lectures is optional but may be monitored to aid in deciding the grades of those students who are close to a grade borderline or who have requested special consideration.

Attendance at the practical is compulsory and will be monitored. Students should attend the practical they enrolled into during the enrolment period. An attendance means at least 50 minutes of attending and participating in practical exercises.

The standard of some of these exercises covered in practicals is similar to that required in the examinations. Also during practicals in which the marked assignments are handed back to the students, the full solutions will be covered during the lab.

These solutions will not be available from anywhere else.

RECOMMENDED TEXTS AND/OR MATERIALS

We will be providing the beta version of a textbook, Kj Byun, Petra Graham and Peter Petocz (2012). Taking Your Chances in Gambling, Sport and Medicine for lectures and also notes for practical classes.

Some other useful background references are:

- D. Rowntree (1981). Statistics without Tears. Penguin [QA276.R66]
- M. Bland (2000). An Introduction to Medical Statistics. Oxford University Press [RA409.B55/2000]
- R. Peck *et al.* (eds.) (2006). Statistics: A Guide to the Unknown 4th Edition. Duxbury Press [QA276.16.S843 2006]

UNIT WEB PAGE

The Department of Statistics web page for this unit can be found at: www.stat.mq.edu.au/undergraduate_programs/stat_units/stat_units100/stat175/ (you can get there conveniently from the Department website www.stat.mq.edu.au by selecting Undergraduate programs, then Statistics Units and then Stat175).

UNIT WEB RESOURCE

There is an iLearn page for the unit that contains notices, lecture notes, weekly exercises, lab materials and some solutions. We will be using iLearn throughout the course.

You can access this from <https://ilearn.mq.edu.au/login/MQ/> . You will be asked for your Macquarie OneID username and password. If you have any problems, try one of the Help buttons.

STUDENT EMAIL ADDRESSES

If iLearn is down, you can send ordinary e-mail.

However, you should at all times use your Macquarie University student e-mail account when contacting us. E-mails from hotmail, yahoo and similar accounts are often stopped by our spam filter, so we may not get to read them. Furthermore, you should check and read your Macquarie University student e-mail on a regular basis (at least twice a week).

LEARNING OUTCOMES

After successfully completing this unit, you will be able to:

- Explain the meaning of common statistical terms that appear in gambling, sport and medicine (Graduate Capability GC 1, see below)
- Apply a range of statistical and probability techniques in these and other areas (GC 1, 2, 3, 6, 7)
- Use a spreadsheet and a statistical computer package to carry out statistical investigations (GC 1, 2, 3 8)
- Communicate the results of your statistical investigations clearly (GC 1, 4)
- Discuss the role that statistics plays in gambling, sporting performance and medical studies (GC 1, 2, 3, 4, 5, 6, 7)
- Discuss ethical problems raised by the use of statistics in gambling, sport and medicine (GC 1, 3, 8, 9)
- Continue any future statistical studies with increased confidence (GC 1, 2, 3, 7)

GRADUATE CAPABILITIES

All academic programs at Macquarie seek to develop students' generic skills in a range of areas. One aim of this unit is that you will develop your skills in literacy, numeracy and information technology; group work and communication; problem solving and critical thinking; and creativity.

In addition to discipline specific learning outcomes, all academic programs at Macquarie assist students to develop or enhance capabilities in a range of areas. The Macquarie Graduate Capabilities are described as:

1. Discipline specific knowledge and skills;
2. Critical, analytical and integrative thinking;
3. Problem solving and research capability;
4. Effective communication;
5. Socially and environmentally active and responsible;
6. Creative and innovative;
7. Commitment to continuous learning;
8. Capable of professional and personal judgement and initiative;
9. Engaged and ethical local and global citizens.

The relationship between Graduate Capabilities and student learning is shown under 'Learning Outcomes' (above).

TEACHING AND LEARNING STRATEGIES

Our role:

- In the 3-hour "lecture" class, we will present new material in the form of lectures, and include a tutorial component where you can practise the techniques and ask questions.
- In the laboratory classes, we will help you work practically, solving problems and analysing data using Microsoft Excel and Minitab.

Your role:

- We expect that you will prepare by printing and reading lecture notes in advance, attending lectures, attending practical sessions and participating in the various learning activities.
- You will work individually and in groups with your fellow students. We also expect that you will make a good attempt at the assignments and final examination.

ASSESSMENT AND ITS RELATION TO LEARNING OUTCOMES

The assessment in this unit consists of the following five components:

| | | |
|--|---------------------|---|
| Assignment 1 | 10% | due by 1pm Monday 3 September 2012 (week 6) |
| Assignment 2 | 10% | due by 1pm Monday 22 October 2012 (week 11) |
| Four labs collected in practical classes | 2% each (total 8%) | lab 2 at the end of the week 3 lab time, Three other labs will be collected at random. |
| Practical participation | 1% each (total 12%) | 1% is for practical attendance and participation in each practical. (The use of mobile phone is not allowed during your practical. Your mobile phone should be put away for the duration of the practical) |
| Final exam | 60% | one <i>handwritten</i> A4 page, both sides, can be taken in and used. Final examination could include similar questions from assignments and practical exercises. |

To pass the unit, you must attend practicals, submit the assignments and selected labs, and perform satisfactorily on the final exam.

Please note that, in order to pass the unit, a satisfactory performance is expected in the final exam, irrespective of your performance in the other components.

If for any reason you cannot hand in your assessment tasks on time, contact the lecturer-in-charge in advance. To approve any extensions, we will need to see satisfactory documentation giving details of illness or misadventure.

LABS

Please prepare by revising the relevant lecture material and be sure to bring your lecture notes and printed lab exercise sheets. Four of the labs will be collected for formal marking (the first one is lab 2, the others will be selected at random). These lab works must be submitted to your lab instructor by the end of your practical session. There may be extra questions asked at the practical session in addition to the ones on the sheets. Also the collection could differ from class to class. Hence all of the labs have potential to be collected.

In order to give an early assessment feedback to the students by the end of week 4, according to the university's assessment policy, lab 2 will be collected for marking by the end of your practical time in week 3.

Some of the labs are carried out using Excel, others using Minitab; you should install a copy of Minitab onto your own computer (download from the Student Portal).

ASSIGNMENTS

You can do the assignments in a group of 2 or 3 (maximum) people, or as an individual. If you are working in a group you will need to certify that both/all of you contributed equally

(which is what we expect), or if not, to indicate which section(s) you each completed. Failure to comply with this could result in a fail mark for your assignments.

Your assignment must be **word-processed** or it will not be marked. The presentation of the layout of your assignment will have some bearing on the mark you receive.

You should hand the assignments in at the Science Centre, E7A102, together with a cover sheet or sheets (*one for each group member*) downloaded from:

http://web.science.mq.edu.au/new_and_current_students/undergrad/assignments_and_coversheets/

Late assignments will *not* be accepted for credit without an appropriate medical certificate. In addition, assignments without appropriate coversheets will not be marked.

Marked assignments will be returned to students during a following practical, and the tutor will give detailed feedback on the complete assignment during that class.

These solutions will *not* be available elsewhere (will not be published on ilearn) and so it is in your best interest to attend the practical.

The assignments are meant to be a learning device as well as being an assessment task and a reasonable attempt to each question is expected. It is *not* worthwhile to copy the solutions from somebody else or plagiarise by other means. Please read the section on plagiarism in the unit outline and the relevant university website specified, very carefully. You should ensure however that you take careful note of any solutions provided in the practical session.

FINAL EXAMINATION

The exam will assess the range of learning outcomes in a formal and individual context, while labs and assignments will assess outcomes in a less formal and group setting. Some questions similar to lecture examples, assignment questions as well as material from your practical sessions will be examined.

The 3-hour final examination for this unit will be held during the University Examination period, that is, sometime between 12-30 November 2012.

MISADVENTURE AND SPECIAL CONSIDERATION PROCESS

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in draft form approximately eight weeks before the start of the examinations and in final form approximately four weeks before the start of the examinations.

<http://www.timetables.mq.edu.au/exam>

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration. Information about unavoidable disruption and the special consideration process is available at

http://www.mq.edu.au/policy/docs/special_consideration/policy.html

and Special Consideration Applications can be made at <https://ask.mq.edu.au/index.php> .

If a Supplementary Examination is granted as a result of special consideration application, it will be scheduled after the conclusion of the official examination period.

It is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period (*and Stat175 examinations are usually near the end of the period!*).

GRADING

Your final grade in STAT175 will be based on your work during semester and in the final examination as specified above. The grades allocated are as set out in the Grading Policy (<http://www.mq.edu.au/policy/docs/grading/policy.html>).

Please note that you must meet the performance standard outlined above in both the coursework and the examination sections of this unit in order to be awarded a particular grade. Your final result will be given as standardised numerical grade (SNG).

ACADEMIC HONESTY POLICY

The University defines academic honesty as: “Plagiarism involves using the work of another person and presenting it as one's own.” Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the *Academic Honesty Policy* at: http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, referral to the University Discipline Committee and/or **exclusion from the university**.

STUDENT SUPPORT SERVICES

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at <http://www.student.mq.edu.au>.

Also the faculty page for student resources and support can be accessed at the link below: http://web.science.mq.edu.au/for/new_and_current_students/student_resources/

Stat175 Gambling, Sport and Medicine – Semester 2, 2012

| Date <i>(Monday)</i> | Wk | Title | Stats topics | Lab class <i>(Tuesday or Wednesday)</i> |
|--------------------------------|-----------|--|---|--|
| 30 July | 1 | Lotto & Lotteries | Introduction Counting techniques | <i>No lab first week</i> |
| 6 August | 2 | Keno | Describing gambling games Probability intervals | 1. Lotto and combinations (Excel) |
| 13 August | 3 | Sport and binomial | Binomial distribution Olympic records | 2. Random variables and Keno (Excel) (lab 2 collected) |
| 20 August | 4 | Sports performance | Normal distribution Z-scores and comparisons | 3. World Cup Hockey (Excel) |
| 27 August | 5 | Health Surveys | | <i>Lab time for assignment preparation</i> |
| 3 Sept | 6 | Medical studies | | (Assignment 1 due Mon) 4. Pulse rates (Minitab) |
| 10 Sept | 7 | Roulette | House margin Chances of being ahead | 5. Births and Diabetes (Minitab) |
| 17 Sept | | Mid-semester break | | |
| 24 Sept | | Mid-semester break | | |
| 1 October | 8 | <i>No lecture – Labour Day</i> <i>Practicals as usual</i> | | Assignment 1 solution discussion. |
| 8 October | 10 | Sports betting | Odds and prices Bookmaking | Lab time for assignment 2 preparation |
| 15 October | 9 | Sport and Poisson | Poisson distribution Chi-squared goodness of fit | 7. Sports betting (Excel) |
| 22 October | 11 | Medical testing | Diagnostic testing | (Assignment 2 due Mon) 8. Soccer Goals (Excel) |
| 29 October | 12 | Forensic Science | Forensic Statistics | 9. Diagnostic testing (Excel) |
| 5 November | 13 | Summary and revision | | Assignment 2 solution discussion and revision. |

Please note in practicals from week 3 through to week 12, three labs will be collected at random. The collection could differ from class to class. All labs selected to be collected must be submitted by the end of your practical session.