STAT175

Gambling, Sport and Medicine

S2 Day 2019

Dept of Mathematics and Statistics

Contents

General Information

Unit convenor and teaching staff
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Credit points
3

Prerequisites

Corequisites

Co-badged status

Unit description
This is a general education unit and recommended for students in all fields of study. There is no assumed knowledge. It is particularly useful for those seeking a better understanding of statistics, using attractive and relevant ideas from areas of popular interest. The unit includes analysis of popular gambling games; the chance of success is calculated along with the testing of various strategies for winning. Statistics also plays an important role in the development of sporting strategies and certain national sports are examined. The use of statistics in the important field of medical science is covered. Ethical aspects of gambling, sport and medicine are discussed.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

At the end of this unit students will be able to explain the meaning of common statistical terms that appear in gambling, sport and medicine.

At the end of this unit students will be able to apply a range of statistical and probability techniques in these and other areas.

At the end of this unit students will be able able to use a spreadsheet and a statistical computer package to carry out statistical investigations.

At the end of this unit students will be able to communicate the results of a statistical investigation clearly.

At the end of this unit students will be able to discuss the role that statistics plays in gambling, sporting performance and medical studies.

At the end of this unit students will be able to demonstrate foundational learning skills including active engagement in their learning process.

General Assessment Information

HURDLES: Participation in Practicals is **compulsory**. Participation will be assessed by observation of students' work during classes or through submission of lab work completed during the class. Participation and reasonable engagement in the class activities in at least 10 out of 12 of the Practicals are requirements to pass the unit. This is a hurdle requirement.

Your final grade is determined by adding the marks obtained for your examinations and assignments. Students should aim to get at least 60% for the course work in order to be reasonably confident of passing the unit.

ATTENDANCE and PARTICIPATION: Please contact the unit convenor as soon as possible if you have difficulty attending and participating in any classes. There may be alternatives available to make up the work. If there are circumstances, such as documented illness or unavoidable disruption, that mean you miss a class you must apply for a Special Consideration.

ASSIGNMENT SUBMISSION: Assignment submission will be online through the iLearn page.

Submit assignments online via the appropriate assignment link on the iLearn page. A personalised cover sheet is not required with online submissions. Read the submission statement carefully before accepting it as there are substantial penalties for making a false declaration.

- Assignment submission is via iLearn. You should upload this as a single scanned PDF file.
- Please note the quick guide on how to upload your assignments provided on the iLearn page.
- Please make sure that each page in your uploaded assignment corresponds to only one A4 page (do not upload an A3 page worth of content as an A4 page in landscape). If you are using

an app like Clear Scanner, please make sure that the photos you are using are clear and shadow-free.

- It is your responsibility to make sure your assignment submission is legible.
- If there are technical obstructions to your submitting online, please email us to let us know.

You may submit as often as required prior to the due date/time. Please note that each submission will completely replace any previous submissions. It is in your interests to make frequent submissions of your partially completed work as insurance against technical or other problems near the submission deadline.

LATE SUBMISSION OF WORK: All assignments or assessments must be submitted by the official due date and time. No marks will be given to late work unless an extension has been granted following a successful application for Special Consideration. Please contact the unit convenor for advice as soon as you become aware that you may have difficulty meeting any of the assignment deadlines. It is in your interests to make frequent submissions of your partially completed work. Note that later submissions completely replace any earlier submission, and so only the final submission made before the due date will be marked.

FINAL EXAM POLICY: 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. The only excuse for not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these special circumstances, you may apply for special consideration via ask.mq.edu.au.

SUPPLEMENTARY EXAMINATIONS:

IMPORTANT: If you receive special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. If you apply for special consideration, you must give the supplementary examination priority over any other pre-existing commitments, as such commitments will not usually be considered an acceptable basis for a second application for special consideration. Please ensure you are familiar with the policy prior to submitting an application. You can check the supplementary exam information page on FSE101 in iLearn (https://bit.ly/FSESupp) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Assessment Tasks

Name	Weighting	Hurdle	Due
Practical Participation	0%	Yes	Weekly
Assignment 1	20%	No	Wednesday Week 6 by 5pm
Assignment 2	30%	No	Wednesday Week 11 by 5pm
Final Examination	50%	No	Formal Examination period

Practical Participation

Due: **Weekly**
Weighting: **0%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

You must attend and participate in at least 10 of the 12 weekly practical classes from week 2 to pass this unit. This is a hurdle requirement. You must attend the class in which you have been enrolled. Participation will be assessed by the demonstrator who will check that lab work is completed in class each week.

On successful completion you will be able to:

- At the end of this unit students will be able to apply a range of statistical and probability techniques in these and other areas.
- At the end of this unit students will be able able to use a spreadsheet and a statistical computer package to carry out statistical investigations.
- At the end of this unit students will be able to communicate the results of a statistical investigation clearly.
- At the end of this unit students will be able to demonstrate foundational learning skills including active engagement in their learning process.

Assignment 1

Due: **Wednesday Week 6 by 5pm**
Weighting: **20%**

Assignment 1 will be available on iLearn. Assignments must be submitted online through Turnitin. A link will be available for submission on iLearn.

On successful completion you will be able to:

- At the end of this unit students will be able to explain the meaning of common statistical terms that appear in gambling, sport and medicine.
- At the end of this unit students will be able to apply a range of statistical and probability techniques in these and other areas.
- At the end of this unit students will be able to communicate the results of a statistical investigation clearly.
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Assignment 2

Due: **Wednesday Week 11 by 5pm**
Weighting: **30%**

Assignment 2 will be available on iLearn. Assignments must be submitted online through Turnitin. A link will be available for submission on iLearn.

On successful completion you will be able to:

- At the end of this unit students will be able to explain the meaning of common statistical terms that appear in gambling, sport and medicine.
- At the end of this unit students will be able to apply a range of statistical and probability techniques in these and other areas.
- At the end of this unit students will be able able to use a spreadsheet and a statistical computer package to carry out statistical investigations.
- At the end of this unit students will be able to communicate the results of a statistical investigation clearly.
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Final Examination

Due: **Formal Examination period**
Weighting: **50%**

The Final Examination will be a two hour written examination (plus ten minutes reading time) and will be held during the examination period. Students will be permitted to take **one A4 sheet (any colour), handwritten on both sides** (using pens and/or pencils and highlighters) into the final examination. This sheet may contain any information deemed useful to the student and must be submitted with the final exam paper at the conclusion of the exam. A standard calculator may also be taken into the final examination (mobile phones and other devices with calculator apps are not permitted for use in the exam).

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Delivery and Resources

Classes

Students are required to attend one 2 hour lecture and one 1 hour practical class each week.

Lectures will start in week 1 and be held on Tuesdays from 3pm to 5pm.

Practicals will start in week 2. Students must attend the class in which they are registered.

The timetable for classes can be found on the University web site at: http://www.timetables.mq.edu.au/.

Teaching and Learning Strategy

Students should attend all lectures and practicals - STAT175 is an internal unit. New material will be presented in each lecture. Lecture notes will be provided on iLearn and should be printed off and brought to classes each week so that students can work through exercises in class. Practical classes will consist of problem solving and data analysis using Microsoft Excel and Minitab18.

Required Text

The eText: ***Taking Your Chances in Gambling, Sport and Medicine*** **by Kj Byun and Peter Petocz (2013)** will be available to purchase on iLearn. Lecture and practical notes are based on this eText.

Recommended texts that may be helpful

- 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 4^{th} *Edition*. Duxbury Press [QA276.16.S843 2006]

Technology Used and Required

The iLearn site for STAT175 and can be accessed at: https://ilearn.mq.edu.au/. Students should check the site regularly to find the latest announcements, lecture handouts, practical worksheets and assignments.

Students must use Macquarie University student e-mail accounts for contacting staff. E-mails

from hotmail, yahoo and similar accounts may be blocked and will not be answered. Students should check Macquarie University student e-mail accounts regularly.

Students will use both Excel and Minitab18 in practical classes. Both of these packages are available in the computer lab. Minitab18 can be downloaded to students' home computers through the student portal.

Unit Schedule

Stat175 Gambling, Sport and Medicine – Session 2, 2019

Date	*Wk*	*eText Reference*	*Topic*	*Labs/Assignments Due*
30 Jul	1	Lotto & Lotteries	Introduction Counting techniques	
6 Aug	2	Keno	Describing gambling games Random variables	Lotto and combinations (Excel)
13 Aug	3	Sport and the Binomial Distribution	Binomial distribution Olympic records	Random variables and Keno (Excel)
20 Aug	4	Sports Performance and the Normal Distribution	Normal distribution Z-scores and comparisons	World Cup Hockey (Excel)
27 Aug	5	Health Surveys	Data types & summaries Comparing means	Normal probabilities (Excel)
3 Sep	6	Medical Studies	Types of studies Odds ratios	***(Assignment 1 due Wed)*** Pulse rates (Minitab)
10 Sep	7	Roulette	House margin Chances of being ahead	Births and Diabetes (Minitab)

		Mid-semester break		
1 Oct	8	Sport and the Poisson Distribution	Poisson distribution Chi-square goodness of fit test	Assignment 1 solution discussion
8 Oct	9	Testing Independence in Medical Studies	Cross tabulations Chi-square test of independence	Roulette (Excel)
15 Oct	10	Sports Betting	Odds and prices Bookmaking	Soccer goals (Excel)
22 Oct	11	Diagnostic Tests in Medicine	Diagnostic testing Conditional probabilites	***(Assignment 2 due Wed)*** Surfing and health (Minitab)
29 Oct	12	Forensic Statistics	Forensic Statistics	Sports betting (Excel)
5 Nov	13		Revision (self study)	

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Undergraduate students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the

key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- At the end of this unit students will be able able to use a spreadsheet and a statistical computer package to carry out statistical investigations.
- At the end of this unit students will be able to discuss the role that statistics plays in gambling, sporting performance and medical studies.
- At the end of this unit students will be able to demonstrate foundational learning skills including active engagement in their learning process.

Assessment tasks

- Assignment 1
- Assignment 2
- Final Examination

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- At the end of this unit students will be able to explain the meaning of common statistical terms that appear in gambling, sport and medicine.
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Assessment tasks

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- Assignment 1
- Assignment 2
- Final Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- At the end of this unit students will be able to explain the meaning of common statistical terms that appear in gambling, sport and medicine.
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Assessment tasks

- Practical Participation

- Assignment 1
- Assignment 2
- Final Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- At the end of this unit students will be able to apply a range of statistical and probability techniques in these and other areas.
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Assessment tasks

- Practical Participation
- Assignment 1
- Assignment 2
- Final Examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- At the end of this unit students will be able to communicate the results of a statistical investigation clearly.
- At the end of this unit students will be able to discuss the role that statistics plays in gambling, sporting performance and medical studies.
- At the end of this unit students will be able to demonstrate foundational learning skills including active engagement in their learning process.

Assessment tasks

- Practical Participation
- Assignment 1
- Assignment 2
- Final Examination

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Assessment task

- Practical Participation