STAT150

Business Statistics

S2 Day 2019

Dept of Mathematics and Statistics

Contents

General Information

Unit convenor and teaching staff
Convenor / Lecturer
Ayse Aysin Bilgin
ayse.bilgin@mq.edu.au
Contact via Email
12 Wally's Walk Office 6.35
See iLearn for consultation hours

Lecturer
Anna Wells
anna.wells@mq.edu.au
Contact via Email
12 Wally's Walk Office 609
See iLearn for consultation hours

Frank Schoenig
frank.schoenig@mq.edu.au

Credit points
3

Prerequisites

Corequisites

Co-badged status

Unit description
Data is the foundation of sound business decisions. In this unit you will learn the fundamentals
of analysing, solving and communicating business problems using quantitative information.
The unit will cover the statistical concepts that provide a foundation for the study of and
professional practice in business and economics. The focus will be on tools and approaches
that are used every day in business. Problems and examples will be drawn from current real-
world experience.

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:

> organise and summarise data graphically and numerically
>
> use appropriate techniques to analyse data
>
> use Excel to manipulate and analyse data
>
> draw conclusions from the results of data analysis
>
> apply statistical techniques to problems arising from diverse fields of research
>
> demonstrate foundational learning skills including active engagement in their learning process

General Assessment Information

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

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 that mean you miss a class, you can apply for a Special Consideration. The only excuse for missing an SGTA or practical class, an in class test (Class Test 1 or 2), a hurdle quiz or the final exam is because of documented illness or unavoidable disruption. In these special circumstances you may apply for special consideration. For approved special considerations to class tests, you will be expected to attend the next available test as determined by the convenor.

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 sometime in the week prior to the exam with the exact date and time of their supplementary examination.

Assessment Tasks

Name	Weighting	Hurdle	Due
SGTA participation	0%	Yes	Weekly
Practical participation	0%	Yes	Weekly
5 Hurdle quizzes	10%	Yes	Week 3, 4, 6, 10 and 12
Class Test 1	15%	No	Week 7 Practical Class
Class Test 2	25%	No	Week 11 Practical Class
Final Examination	50%	No	University Examination Period

SGTA 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 SGTA classes from week 2 to pass this unit. This is a hurdle requirement. Participation will be recorded via iLearn so you will need a mobile device. If you do not bring a mobile device you must tell your instructor **on the day of your SGTA**. Late notification of attendance will not be accepted. You **must** attend the class that you are registered into.

On successful completion you will be able to:
  • organise and summarise data graphically and numerically
  • use appropriate techniques to analyse data
  • draw conclusions from the results of data analysis
  • apply statistical techniques to problems arising from diverse fields of research
  • demonstrate foundational learning skills including active engagement in their learning process

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 to pass this unit. This is a hurdle requirement. Participation will be recorded via iLearn during your class. You must attend the class that you are registered into.

On successful completion you will be able to:
  • organise and summarise data graphically and numerically
  • use appropriate techniques to analyse data
  • use Excel to manipulate and analyse data
  • apply statistical techniques to problems arising from diverse fields of research
  • demonstrate foundational learning skills including active engagement in their learning process

5 Hurdle quizzes

Due: **Week 3, 4, 6, 10 and 12**

Weighting: **10%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

The Hurdle Quizzes are online quizzes that will be made available on iLearn at least two weeks prior to the due dates. Students are allowed an unlimited number of attempts to complete each quiz until the deadline. The required pass mark is indicated on each quiz. Inability to pass a quiz without help indicates that students should visit the Numeracy Centre for help. The highest score obtained will count towards the final grade. Each quiz is worth 2%. Extensions will not be given without an approved Special Consideration application. **Completion and passing of all Hurdle Quizzes is a hurdle requirement. If you fail to do so, you will fail the unit regardless of other assessment tasks marks**.

On successful completion you will be able to:

- use appropriate techniques to analyse data

- use Excel to manipulate and analyse data

- draw conclusions from the results of data analysis

- apply statistical techniques to problems arising from diverse fields of research

- demonstrate foundational learning skills including active engagement in their learning process

Class Test 1

Due: **Week 7 Practical Class**
Weighting: **15%**

Class Test 1 will be held in practical classes in week 7. This test must be taken in the practical class in which you are registered. **Students must bring their student ID**. Failure to supply ID will mean exclusion from the test. A standard calculator may be taken into the class test (mobile phones and other devices with calculator apps are not permitted). No other material (apart from writing equipment) will be permitted in the class test. A supplementary class test will be given for students with an approved Special Consideration application.

On successful completion you will be able to:

- organise and summarise data graphically and numerically

- use appropriate techniques to analyse data

- use Excel to manipulate and analyse data

- draw conclusions from the results of data analysis

- apply statistical techniques to problems arising from diverse fields of research

Class Test 2

Due: **Week 11 Practical Class**
Weighting: **25%**

Class Test 2 will be held in practical classes in week 11. This test must be taken in the practical class in which you are registered. **Students must bring their student ID**. Failure to supply ID will mean exclusion from the test. A standard calculator may be taken into the class test (mobile phones and other devices with calculator apps are not permitted). No other material (apart from writing equipment) will be permitted in the class test. A supplementary class test will be given for students with an approved Special Consideration application.

On successful completion you will be able to:

- organise and summarise data graphically and numerically

- use appropriate techniques to analyse data

- use Excel to manipulate and analyse data

- draw conclusions from the results of data analysis

- apply statistical techniques to problems arising from diverse fields of research

Final Examination

Due: **University 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 which runs from 11th November to 29th November, 2019. 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). See the week 13 iLearn area for more details on preparing for the final exam.

The University Examination timetable will be available in draft form approximately eight weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations at:http://www.timetables.mq.edu.au/

Students are advised that 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, i.e. the final day of the official examination period.

On successful completion you will be able to:

- organise and summarise data graphically and numerically

- use appropriate techniques to analyse data

- use Excel to manipulate and analyse data

- draw conclusions from the results of data analysis

- apply statistical techniques to problems arising from diverse fields of research

- demonstrate foundational learning skills including active engagement in their learning

process

Delivery and Resources

Classes

Students should enrol in the following classes each week:

- 1 x 2 hour lecture beginning in Week 1 (attend either in-person if enrolled into a class or via the live lecture if enrolled in the live stream)
- 1 x 1 hour Small Group Teaching Activity (SGTA) beginning in Week 2. Attendance and participation is a compulsory hurdle requirement!
- 1 x 1 hour practical beginning in Week 2. Attendance and participation is a compulsory hurdle requirement!

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

Students can change their SGTA and practical classes online only by using eStudent at: https://student1.mq.edu.au/. **Do not enrol in clashing classes! Attendance is compulsory!**

Required and Recommended Texts and/or Materials

- A standard calculator should be brought to all classes.
- Excel 2016 (or a later version) for Microsoft Windows or Excel 2016 for Mac will be used throughout the unit. Students without one of these versions of Excel can download Excel 2016 (or the whole Office suite) from the University. See the University Wiki page for details. Please visit IT for help with installation problems.

Recommended Text:

- *Business Statistics STAT150: A Custom Edition for Macquarie University* (ISBN 9781488616099). Note that this is a subset of the chapters in *Business Statistics 3rd Edition Global Edition* by Sharpe, De Veaux and Velleman . This book, with the MyStatLab key, will be used throughout this unit. It can be purchased in hard copy from the Coop Bookshop or directly from Pearson. An e-book with MyStatLab is also available (ISBN 9781488687617). The week 1 area of iLearn includes information on how to register into MyStatLab. The MyStatLab course ID for this session is available in iLearn.

Technology Used and Required

All course material is delivered through iLearn (which is a version of Moodle). The link may be found at http://ilearn.mq.edu.au

Unit Schedule

WEEK	LECTURE TOPIC	Assessments
1	Introduction to statistics	
2	Summarising and displaying data	
3	Summarising and displaying data (continued)	Hurdle Quiz 1
4	Introduction to distributions: the normal distribution	Hurdle Quiz 2
5	Sampling distributions and confidence intervals for proportions	
6	Sampling distributions and confidence intervals for means	Hurdle Quiz 3
7	One sample hypothesis tests for a population mean	Class Test 1 (in practical class)
Semester Break		
8	Hypothesis tests for comparing population means	
9	Simple linear regression (Part 1)	
10	Simple linear regression (Part 2)	Hurdle Quiz 4
11	Hypothesis tests for population proportions: z-test of a proportion and chi-squared goodness-of-fit test	Class test 2 (in practical class)
12	Chi-squared test of independence	Hurdle Quiz 5
13	Revision	

Learning and Teaching Activities

Lectures

Lectures begin in Week 1. Students are expected to attend one 2-hour lecture session per week if enrolled in the lecture or watch the live-stream if enrolled in the Live Stream option. Copies of the lecture slides will be made available via iLearn. Students are strongly advised to read and bring a copy of the lecture slides (printed or soft copy) and answer questions on the slides during the lecture. The lectures are also recorded via 'Echo360', and can be accessed on iLearn (under Echo Recordings). Any student who misses a lecture must work through the Echo recording before he/she will be able to progress to the next lecture.

Small Group Teaching Activities (SGTA)

SGTAs begin in Week 2. Each SGTA is based on work from the previous week's lecture. The aim of these classes is to practice techniques and understand concepts learned in lectures. These classes are designed for students to work together in teams. The emphasis on team work is to explore ideas, devise and ask questions and plan ways to answer them. Material will be made available via iLearn. Students should read and bring a copy of SGTA material (printed or soft copy) to their class each week. SGTA attendance and participation is a hurdle requirement.

Practicals

Practical classes begin in Week 2. Every week throughout the semester students will be required to work through practical material that teaches them how to apply the statistical techniques learned during lectures and SGTA classes by using Excel. The weekly practical material is based on work from the previous week's lecture. Practical material, and the required Excel datasets, will be made available via iLearn. Students should read and bring the practical material (printed or soft copy) to their practical session each week. Students preferring to use their own computers to do the practical work are encouraged to do so provided they have installed a suitable version of Excel. Practical attendance and participation is a hurdle requirement.

Hurdle Quizzes: Weeks 3, 4, 6, 10 and 12

Five hurdle quizzes will be available for completion. The quizzes are designed to give students an opportunity to practice theoretical, procedural and interpretational aspects of statistics. The first quiz is designed to assess students' ability to cope with the mathematical content of STAT150. The other quizzes are designed to help students revise and reinforce the concepts covered in lectures, SGTAs and practicals, and to help students prepare for class tests and the final exam. Students are allowed an unlimited number of attempts at each quiz. Each quiz will open approximately two weeks before its scheduled due date. Each time a student attempts a quiz, a new version of it will be generated. Students who have problems with quiz questions should seek help from the Numeracy Centre or during staff consultation hours.

Help with STAT150 related administrative matters

For help with STAT150 related administrative matters (such as class enrolment) students should email: stat150.admin@mq.edu.au

Staff consultation (office) hours

Staff on the unit have consultation hours each week when they are available to help students enrolled in STAT150. These consultation hours can be seen on iLearn. You do not need to make appointments at these times. Just come to the office of whichever staff member is available at that time. The department is located on levels 5, 6 and 7 of 12 Wally's Walk.

Numeracy Centre

The Numeracy Centre exists to help students who are experiencing difficulties with numeracy-based subjects such as STAT150. Any student who lacks the knowledge of mathematics needed for STAT150 is encouraged to seek the help of the Centre, which is located in 14 Sir Christopher Ondaatje Ave (14SCOA) 188 . The Centre offers a number of services including individual help, supplementary workshops that run each week and an opportunity to meet with other students to discuss problems. STAT150 assumes knowledge of high school mathematics. Anyone without this knowledge should take a mathematics unit prior to enrolling in STAT150.

Computing Laboratories

Excel 16 will be used in practical sessions. Computing labs use iLab, so work undertaken must be saved to the iLab desktop and then emailed. Opening hours of computing laboratories during semester: 8am - 10pm Mon-Fri 9am - 5pm Sat-Sun For opening hours during semester breaks, see the notice boards outside the computing laboratories. Look for additional information on the whiteboards in the labs. Please note that computing labs may be booked for classes. Check the timetable on the door of the lab to make sure that the room is free.

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

- use appropriate techniques to analyse data
- draw conclusions from the results of data analysis
- apply statistical techniques to problems arising from diverse fields of research

Assessment tasks

- 5 Hurdle quizzes
- Final Examination

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcome

- demonstrate foundational learning skills including active engagement in their learning process

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

- organise and summarise data graphically and numerically
- use appropriate techniques to analyse data
- use Excel to manipulate and analyse data
- draw conclusions from the results of data analysis
- apply statistical techniques to problems arising from diverse fields of research
- demonstrate foundational learning skills including active engagement in their learning process

Assessment tasks

- SGTA participation
- Practical participation
- 5 Hurdle quizzes
- Class Test 1
- Class Test 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

- organise and summarise data graphically and numerically
- use appropriate techniques to analyse data
- use Excel to manipulate and analyse data
- draw conclusions from the results of data analysis
- apply statistical techniques to problems arising from diverse fields of research

Assessment tasks

- SGTA participation
- Practical participation
- 5 Hurdle quizzes
- Class Test 1
- Class Test 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

- use appropriate techniques to analyse data
- use Excel to manipulate and analyse data
- draw conclusions from the results of data analysis
- apply statistical techniques to problems arising from diverse fields of research

Assessment tasks

- SGTA participation
- Practical participation
- 5 Hurdle quizzes
- Class Test 1
- Class Test 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

- organise and summarise data graphically and numerically
- draw conclusions from the results of data analysis
- apply statistical techniques to problems arising from diverse fields of research

Assessment tasks

- SGTA participation
- Practical participation

- Class Test 1
- Class Test 2
- Final Examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- apply statistical techniques to problems arising from diverse fields of research
- demonstrate foundational learning skills including active engagement in their learning process

Assessment task

- 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:

Learning outcomes

- use appropriate techniques to analyse data
- use Excel to manipulate and analyse data
- apply statistical techniques to problems arising from diverse fields of research

Assessment task

- Final Examination

Changes since First Published

Date	Description
22/07/2019	Revised and made consistent information in regards to start of SGTA in week 2.