



STAT8602

Mathematical Background for Biostatistics

Session 2, Fully online/virtual 2020

Department of Mathematics and Statistics

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Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff

Lecturer

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Lecturer

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Monday 15-17

Credit points

10

Prerequisites

Admission to MBioStat or GradDipBioStat or GradCertBioStat

Corequisites

Co-badged status

Unit description

In this unit, we develop the mathematical background needed to understand the proofs and mathematical reasoning used in the detailed treatment of biostatistical methods in subsequent units in the biostatistics program. Completion of this unit will allow students to concentrate on the statistical concepts presented in the later units, without being distracted by the detail of the mathematical techniques. The unit covers basic algebra and analysis; exponential functions; calculus; series, limits, approximations and expansions; linear algebra, matrices and determinants; and numerical methods. Because of the multi-institutional nature of the BCA units, there is an early cut-off for enrolment in this unit, which is typically one week before the start of the session. Please contact the program coordinator for details.

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:

ULO1: Demonstrate a broad understanding of the mathematics underlying key statistical methods.

ULO2: Demonstrate an understanding of basic algebra and analysis, and the ability to manually differentiate and integrate algebraic expressions, and perform Taylor series expansions.

ULO3: Understand the basic laws of probability, and the calculus basis of expectation and distribution theory.

ULO4: Perform matrix manipulations manually.

ULO5: Understand the numerical methods behind solutions of equations regularly encountered in methods in biostatistics.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Assignment 3</u>	40%	No	16/11/2020
<u>Assignment 2</u>	40%	No	5/10/2020
<u>Assignment 1</u>	20%	No	31/08/2020

Assignment 3

Assessment Type [1](#): Case study/analysis

Indicative Time on Task [2](#): 25 hours

Due: **16/11/2020**

Weighting: **40%**

Assignment 3 will cover Module 3.

On successful completion you will be able to:

- Perform matrix manipulations manually.
- Understand the numerical methods behind solutions of equations regularly encountered in methods in biostatistics.

Assignment 2

Assessment Type [1](#): Case study/analysis

Indicative Time on Task [2](#): 25 hours

Due: **5/10/2020**

Weighting: **40%**

Assignment 2 will cover Module 2.

On successful completion you will be able to:

- Understand the basic laws of probability, and the calculus basis of expectation and

distribution theory.

Assignment 1

Assessment Type ¹: Case study/analysis

Indicative Time on Task ²: 10 hours

Due: **31/08/2020**

Weighting: **20%**

Assignment 1 will cover Module 1.

On successful completion you will be able to:

- Demonstrate a broad understanding of the mathematics underlying key statistical methods.
- Demonstrate an understanding of basic algebra and analysis, and the ability to manually differentiate and integrate algebraic expressions, and perform Taylor series expansions.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

1. Calculus Early Transcendentals, 11th Edition, Anton et al. There are a number of similar editions. Be sure to search by the ISBN number. See the entries for this book on pages 2 and 3. It can be found on the companion website, Australian distributor It is also available from university bookshops, from Jacaranda Wiley Ltd (1800 777 474) or online from booktopia.com.au or fishpond.com.au or amazon.com or via www.addall.com.

2. Elementary Linear Algebra, 12th Edition, Anton et al. There are two versions of this textbook, the standard one and the “Application version”. The former is the one used in the unit (ISBN: 978119268048); the latter is not needed, but you can buy the one you prefer. The only difference is that the “Applications Version” has additional material at the end that is not used in the unit. The first part is common to both versions, so the paragraph and the exercise numbers are the same. As a further note, the eText referenced on pp2 and 3 is only available as “Application version”. Australian distributor It is also available from university bookshops, from Jacaranda Wiley Ltd (1800 777 474) or online from fishpond.com.au or amazon.com or via www.addall.com

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#) (<https://staff.m>

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.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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 help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)

- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

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.