



# MEDI2201

## Clinical Bioinformatics

Session 2, Special circumstance 2020

*Medicine, Health and Human Sciences Faculty level units*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

#### 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

Edwin Lim

[edwin.lim@mq.edu.au](mailto:edwin.lim@mq.edu.au)

Credit points

10

Prerequisites

(STAT170 or STAT1170) and FOSE1025

Corequisites

Co-badged status

Unit description

This unit builds on the basic computing and programming knowledge acquired in the first year to extend understanding of coding and its application to biostatistics and bioinformatics. This unit focuses on the basic concepts of statistical methodologies and common statistical techniques used to analyse genomic, proteomic and metabolomic data in order to understand the molecular mechanisms of human diseases and treatment response. In this unit, you will explore coding languages behind statistical techniques applied in the analyses of "omics" data and gain an understanding of how to interpret and present data generated from basic and clinical research. Learning activities will include lectures, online assessments, interactive tutorials and computer-based practicals. Through this unit you will gain biostatistics and bioinformatics skills that will be critical for a profession in medicine, public health, research or data science.

## 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:** Apply fundamental knowledge of coding functions and statistical terminology and their relevance in biostatistics and bioinformatics.

**ULO2:** Appraise statistical approaches underpinning study design for research in genomics, proteomic and metabolomics.

**ULO4:** Implement common statistical approaches to analyse genomic, proteomic and

metabolomics data.

**ULO5:** Interpret statistical and graphical outputs to communicate biological processes that underlie human diseases and treatment response.

**ULO3:** Organise and manage datasets generated from next generation sequencing technologies.

## General Assessment Information

### General Assessment Information

Grade descriptors and other information concerning grading are contained in Schedule 1 of the Macquarie University Assessment Policy, which is available at: <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment>.

Further details for each assessment task will be available on iLearn.

All final grades in the Bachelor of Medical Sciences are determined by a grading committee and are not the sole responsibility of the Unit Convenor.

Students will be awarded a final grade plus a Standardised Numerical Grade (SNG). The SNG is not necessarily a summation of the individual assessment components. The final grade and SNG that are awarded reflect the corresponding grade descriptor in the Grading Policy.

To pass this unit, students must demonstrate sufficient evidence of achievement of the learning outcomes, attempt all assessment tasks, meet any ungraded requirements including professionalism and achieve an SNG of 50 or better.

### Student Professionalism

In the Faculty of Medicine and Health Sciences, professionalism is a key capability embedded in all our courses. As part of developing professionalism, students are expected to attend all small group interactive sessions including tutorials, as well as complete online and laboratory-based practical sessions.

Furthermore, lectures and seminars are key learning activities that you are expected to attend throughout the Bachelor of Clinical Science course. While audio recordings and lecture slides may be made available following these large group sessions, it is important to recognise that such resources are a study aid - and should not be considered an alternative to lecture or seminar attendance.

Students who do not maintain adequate attendance (greater than or equal to 80% of scheduled classes) may be deemed unable to meet expectations regarding professionalism and may be referred for disciplinary action (which may include exclusion from assessments and unit failure).

Similarly, as part of developing professionalism, students are expected to submit all work by the due date. Applications for assessment task extensions must be supported by appropriate evidence and submitted via [ask.mq.edu.au](https://ask.mq.edu.au). For further details please refer to the Special Consideration Policy available at <https://students.mq.edu.au/study/my-study-program/special-con>

sideration**Late Submission**

All assignments which are officially received after the due date, and where no extension or special consideration has been granted, will incur a deduction of 5% per day up until 10 days after due date, after which the assignment will not be accepted. Weekends and public holidays are included.

**Assessment Tasks**

Name	Weighting	Hurdle	Due
<u>Online quiz</u>	0%	No	Week 4, 9, 11, and 13
<u>Mid semester exam</u>	25%	No	Week 7
<u>Case study analysis and presentation</u>	25%	No	Week 12
<u>Final exam</u>	50%	No	Week 13 (Coding) and Week 14 (Written)

**Online quiz**

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 8 hours

Due: **Week 4, 9, 11, and 13**

Weighting: **0%**

Online quiz (total of four throughout the unit) using a combination of multiple choice and short answer questions assessing lecture, tutorial and practical content

On successful completion you will be able to:

- Apply fundamental knowledge of coding functions and statistical terminology and their relevance in biostatistics and bioinformatics.
- Appraise statistical approaches underpinning study design for research in genomics, proteomic and metabolomics.
- Interpret statistical and graphical outputs to communicate biological processes that underlie human diseases and treatment response.

## Mid semester exam

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week 7**

Weighting: **25%**

Formal written exam assessing content delivered across the session using a combination of short answer and multiple choice questions

On successful completion you will be able to:

- Apply fundamental knowledge of coding functions and statistical terminology and their relevance in biostatistics and bioinformatics.
- Appraise statistical approaches underpinning study design for research in genomics, proteomic and metabolomics.
- Implement common statistical approaches to analyse genomic, proteomic and metabolomics data.

## Case study analysis and presentation

Assessment Type <sup>1</sup>: Case study/analysis

Indicative Time on Task <sup>2</sup>: 25 hours

Due: **Week 12**

Weighting: **25%**

Group research and presentation on an assigned case study

On successful completion you will be able to:

- Apply fundamental knowledge of coding functions and statistical terminology and their relevance in biostatistics and bioinformatics.
- Implement common statistical approaches to analyse genomic, proteomic and metabolomics data.
- Organise and manage datasets generated from next generation sequencing technologies.

## Final exam

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 25 hours

Due: **Week 13 (Coding) and Week 14 (Written)**

Weighting: **50%**

Formal written exam assessing content delivered across the session using a combination of short answer and multiple choice questions. This task is completed under examination conditions during the university examination period

On successful completion you will be able to:

- Apply fundamental knowledge of coding functions and statistical terminology and their relevance in biostatistics and bioinformatics.
- Appraise statistical approaches underpinning study design for research in genomics, proteomic and metabolomics.
- Implement common statistical approaches to analyse genomic, proteomic and metabolomics data.
- Organise and manage datasets generated from next generation sequencing technologies.

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<sup>1</sup> 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.

<sup>2</sup> 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

This unit adopts a distance learning approach where students are required to engage in independent learning from the unit materials and tasks provided on iLearn. The unit consists of five core topics and is divided into lecture content and coding activities. There will be 2 hours of lecture content and 3 hours of coding activities per week. The opportunity for additional interactions is allocated for each core topic every 2-3 weeks, facilitated by a 2-hour lecture, a 2-hour tutorial and a 2-hour practical session per topic.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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.*)

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 \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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](http://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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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.