



# TELE8085

## 5G Mobile Networks

Session 2, Special circumstance 2020

*School of Engineering*

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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

Unit Convener/Lecturer

Robert Abbas

[robert.abbas@mq.edu.au](mailto:robert.abbas@mq.edu.au)

Contact via 98501558

44W Rd , Room 124

Tuesdays 12-1PM

Tutor

Roshan Pokharel

[roshan.pokharel@mq.edu.au](mailto:roshan.pokharel@mq.edu.au)

Online

Credit points

10

Prerequisites

Admission to MEngNetTeleEng or Admission to MEngElecEng

Corequisites

Co-badged status

Unit description

This unit explores The most advanced technologies in the field of all IP Mobile Communications Networks, 5G Vision and services , 5G Frequency band , 5G Physical layer, Frame structure and physical layer Parameters , 5G Coverage , Channel models and link Budget, 5G architecture and cloud RAN, Network Virtualization for 5G, Cloud computing , 5G EMBB Application and requirements, 5G Ultra low latency (5G-V2X) and critical application using Edge computing, 5G Massive connectivity and massive IoT, advanced and what lies ahead in mobile communications, 5G Network operation and mobility, optimization and KPIs Management , 5G security and advanced 5G application.

## 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:** Describe 5G Network Vision, Architecture and use case

**ULO2:** Articulate knowledge of 5G Architecture, Cloud RAN and physical layer structure and parameters

**ULO3:** Competently apply deep knowledge of 5G Network Coverage, Capacity, operation and management and 5G security

**ULO4:** Critically analyse 5G Use case, 5G network security and Network performance management 5G Security

**ULO5:** Proficiently apply 5G standard, use cases, application, features, analytics for operators live network management

## General Assessment Information

5G Tool Box/ Matlab for lab and project, and Final Exam

W1-W2,W3,W4,W5 : weekly Lab reports will be marked for 20%

Unit final exam will be marked 50% ,

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>weekly</u>	20%	No	W1,W2,W3,W4,W5
<u>Group Project based learning</u>	30%	No	W6 proposal, W9 progress, W13 Presentation
<u>Final Exam</u>	50%	No	W13

### weekly

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 16 hours

Due: **W1,W2,W3,W4,W5**

Weighting: **20%**

5G Tool Box software simulate 5G fundamentals

On successful completion you will be able to:

- Describe 5G Network Vision, Architecture and use case
- Articulate knowledge of 5G Architecture, Cloud RAN and physical layer structure and parameters
- Competently apply deep knowledge of 5G Network Coverage, Capacity, operation and management and 5G security

## Group Project based learning

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

Indicative Time on Task <sup>2</sup>: 18 hours

Due: **W6 proposal, W9 progress, W13 Presentation**

Weighting: **30%**

Project for 5G modern application

On successful completion you will be able to:

- Competently apply deep knowledge of 5G Network Coverage, Capacity, operation and management and 5G security
- Critically analyse 5G Use case, 5G network security and Network performance management 5G Security
- Proficiently apply 5G standard, use cases, application, features, analytics for operators live network management

## Final Exam

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

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **W13**

Weighting: **50%**

Final Exam

On successful completion you will be able to:

- Describe 5G Network Vision, Architecture and use case
- Articulate knowledge of 5G Architecture, Cloud RAN and physical layer structure and parameters

- Competently apply deep knowledge of 5G Network Coverage, Capacity, operation and management and 5G security
  - Critically analyse 5G Use case, 5G network security and Network performance management 5G Security
  - Proficiently apply 5G standard, use cases, application, features, analytics for operators live network management
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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

100% Online Lectures, lab and projects

## Unit Schedule

Tuesdays :10-12 PM Lectures Online real time zoom

Tuesdays : 5-7 PM Lab and project

## 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 \(http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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](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.

## Changes from Previous Offering

More 5G security Focus