



ELEC881

Telecommunications Performance Analysis

S2 Day 2017

Dept of Engineering

Contents

| | |
|--|----|
| <u>General Information</u> | 2 |
| <u>Learning Outcomes</u> | 2 |
| <u>General Assessment Information</u> | 3 |
| <u>Assessment Tasks</u> | 4 |
| <u>Delivery and Resources</u> | 6 |
| <u>Unit Schedule</u> | 6 |
| <u>Policies and Procedures</u> | 6 |
| <u>Graduate Capabilities</u> | 8 |
| <u>Changes in Response to student feedback</u> | |
| | 11 |

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.

General Information

Unit convenor and teaching staff

Robert Abbas

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E6B , Room 115

Tuesdays 2-4 pm & Thursdays 2-4 pm

Credit points

4

Prerequisites

Admission to MEng

Corequisites

Co-badged status

Unit description

This unit will develop the knowledge of the modern and future Networks performance management and optimization analysis skills and gives an understanding of Key Performance Indicators Analysis of modern Communication Networks multi-layer multi-technology networks, QoS (Voice and Data all IP, E2E everywhere, any time) , Networks Accessibility, Retain ability, Mobility, Throughput, Integrity, O&M, Load balancing , Web Engineering Analysis.

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:

Demonstrate ability to draw and describe the Information Communication Technology (ICT) networks (internet networks, 4G/5G networks, data centres, clouds, etc.) and end-to-end architecture.

Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.

Demonstrate ability to execute daily routines and tasks for network operations, troubleshooting and network security.

Demonstrate competence in the ICT network performance management, analysis and

network tools.

Demonstrate competence in evaluating performance and requirements for network security.

General Assessment Information

Notifications

Formal notification of assessment tasks, grading rubrics and due dates will be posted on iLearn. Although all reasonable measures are taken to ensure the information is accurate, The University reserves the right to make changes without notice. Each student is responsible for checking iLearn for changes and updates.

Report and Assignment Submissions

Assignment solutions will be posted within a week after the submission date. Submissions will not be accepted once the solution is posted.

All reports and assignments must be submitted electronically through iLearn (in pdf format). Submissions will undergo plagiarism checkers using the turnitin software and any work deemed to have 20% or higher similarity score may incur academic penalty. For more details on the policies of academic penalties relating to academic honesty, please refer to the policies and procedures section below.

Submissions are expected to be typed set in a logical layout and sequence. The expected workload includes preparation of final copies and clear diagrams.

Late submissions

Late submissions will not be accepted without prior arrangement made at least one week before the submission date. Extenuating circumstances will be considered upon lodgement of a formal notice of disruption of studies.

Grading and passing requirement for unit

For further details about grading, please refer below in the policies and procedures section.

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).

Student Responsibilities

Be familiar with University policy and College procedures and act in accordance with those policy and procedures.

It is the responsibility of the student to retain a copy of any work submitted. Students must produce these documents upon request. Copies should be retained until the end of the grade appeal period each term.

Student is to perform the required due diligent for their assessment grade and rectify as soon as possible upon finding any errors.

Assessment Tasks

| Name | Weighting | Hurdle | Due |
|--|-----------|--------|--------|
| <u>Inclass Test 1</u> | 20% | No | W5 |
| <u>Inclass Test 2</u> | 20% | No | W11 |
| <u>Students Project Presentation</u> | 10% | No | W4-W13 |
| <u>Research Project Report</u> | 50% | No | W14 |

Inclass Test 1

Due: **W5**

Weighting: **20%**

Inclass Test

On successful completion you will be able to:

- Demonstrate ability to draw and describe the Information Communication Technology (ICT) networks (internet networks, 4G/5G networks, data centres, clouds, etc.) and end-to-end architecture.
- Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.

Inclass Test 2

Due: **W11**

Weighting: **20%**

Inclass Test

On successful completion you will be able to:

- Demonstrate ability to execute daily routines and tasks for network operations, troubleshooting and network security.
- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Students Project Presentation

Due: **W4-W13**

Weighting: **10%**

Presentations for the group project carried out in this unit. Marks will be allocated to each member of the group based on competency and hands on activity. Students will be presenting in groups, but the marking will be done based on individual presentations. Guidelines and rubrics will be made available through iLearn.

On successful completion you will be able to:

- Demonstrate ability to draw and describe the Information Communication Technology (ICT) networks (internet networks, 4G/5G networks, data centres, clouds, etc.) and end-to-end architecture.
- Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.
- Demonstrate ability to execute daily routines and tasks for network operations, troubleshooting and network security.
- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Research Project Report

Due: **W14**

Weighting: **50%**

This report will be based on the findings of a research project that students will undertake. The project will be based on measurement of live networks or network nodes, in order to provide performance measurements and analysis of ICT networks and key performance indicators (KPI).

Detailed guidelines and rubric will be provided on iLearn. 50% of the total marks for this assessment will be for individual work for each of the group member and 50% for the group work.

On successful completion you will be able to:

- Demonstrate ability to draw and describe the Information Communication Technology (ICT) networks (internet networks, 4G/5G networks, data centres, clouds, etc.) and end-to-end architecture.
- Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.
- Demonstrate ability to execute daily routines and tasks for network operations,

troubleshooting and network security.

- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Delivery and Resources

The aim of this unit is to enable the students to become job-ready and to have the skills which satisfy current and future ICT industry requirements.

Lectures will be interactive with students encouraged to participate and engage in discussions through Q&A, industry examples and scenarios, case studies, smart mobile applications, projects and students presentations. This will make sure that students gain a good understanding of the concepts and applications.

This unit will be taught from practice, and hands on measurements and theory point of view. The unit will explore the current and future ICT networks architectures, services from the point of view of performance requirements and optimization as well as analysis.

Unit will cover fundamentals of heterogenous networks, multi-access technology, multi-layer networks, software defined networks, data centres, and cloud multi-tenant multi-band networks. The unit will also provide a comprehensive introduction to monitoring and optimization of key performance indicators, load balancing, web traffic engineering, network tools and measurements.

Students will be required to carry out a research project based on measurement of live networks or network nodes, in order to provide performance measurements and analysis of key performance indicators for ICT networks.

Unit Schedule

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student_conduct/

Results

Results shown in *iLearn*, 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.

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

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

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Demonstrate ability to execute daily routines and tasks for network operations, troubleshooting and network security.
- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Assessment task

- Research Project Report

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Demonstrate ability to draw and describe the Information Communication Technology (ICT) networks (internet networks, 4G/5G networks, data centres, clouds, etc.) and end-to-end architecture.
- Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.
- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Assessment tasks

- Inclass Test 1

- Inclass Test 2
- Students Project Presentation
- Research Project Report

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Demonstrate ability to draw and describe the Information Communication Technology (ICT) networks (internet networks, 4G/5G networks, data centres, clouds, etc.) and end-to-end architecture.
- Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.
- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Assessment tasks

- Inclass Test 1
- Inclass Test 2
- Research Project Report

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.
- Demonstrate ability to execute daily routines and tasks for network operations,

troubleshooting and network security.

- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Assessment tasks

- Inclass Test 2
- Students Project Presentation
- Research Project Report

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Demonstrate hands-on learning in key performance indicators for ICT networks, measurement and monitoring approaches.
- Demonstrate ability to execute daily routines and tasks for network operations, troubleshooting and network security.
- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Assessment tasks

- Inclass Test 1
- Inclass Test 2
- Students Project Presentation
- Research Project Report

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to

national and global issues

This graduate capability is supported by:

Learning outcomes

- Demonstrate ability to execute daily routines and tasks for network operations, troubleshooting and network security.
- Demonstrate competence in the ICT network performance management, analysis and network tools.
- Demonstrate competence in evaluating performance and requirements for network security.

Assessment tasks

- Inclass Test 1
- Students Project Presentation
- Research Project Report

Changes in Response to student feedback

Unit content and teaching will be changed from classical theoretical telecom to practical information technology networks and measurement oriented unit.