



MONASH University
Information Technology

FIT5083
Wireless networks

Unit Guide

Semester 2, 2011

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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FIT5083 Wireless networks - Semester 2, 2011

This unit will review the basic concepts of networking technologies and analyse technological aspects of the wireless network. Main topics will include: antenna and propagation for wireless systems, fundamentals of physical layers used in wireless networks, wireless local area networks (WLAN/WiFi), WiMax systems, mobile network technologies (3G and LTE), mesh networks. The unit will also cover advanced topics in wireless networking.

- IEEE standards: 802.11, 802.16, 802.15
- ITU-T LTE standards

Mode of Delivery

- Caulfield (Day)
- South Africa (Day)

Contact Hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload

Students will be expected to spend a total of 12 hours per week during semester on this unit as follows:

- Lectures: 2 hours per week
- Tutorials/Lab Sessions: 2 hours per week per tutorial
- and up to an additional 8 hours in some weeks for completing lab and project work, private study and revision.

Unit Relationships

Prohibitions

CPE4002, CSE4882, GCO4824, CSE5807

Chief Examiner

Associate Professor Andrew Paplinski

Campus Lecturer

Caulfield

Andrew P. Paplinski

South Africa

Oladayo Bello

Academic Overview

Learning Objectives

At the completion of this unit students will be able to:

- describe the basic characteristics of layered protocol networking model and wireless mobile systems;
- understand architecture and signal characteristics of cellular communication systems;
- understand physical and media access control layers used in wireless technologies for signal encoding, spread spectrum and error control;
- understand architectures of: WiFi, WiMax, and advanced mobile networking systems like LTE as described in relevant standards;
- understand concepts behind mesh networks;
- analyse advanced topics in wireless networking.

Graduate Attributes

Monash prepares its graduates to be:

1. responsible and effective global citizens who:
 - a. engage in an internationalised world
 - b. exhibit cross-cultural competence
 - c. demonstrate ethical values

critical and creative scholars who:

- a. produce innovative solutions to problems
- b. apply research skills to a range of challenges
- c. communicate perceptively and effectively

Assessment Summary

Examination (3 hours): 60%; In-semester assessment: 40%

Assessment Task	Value	Due Date
Assignment 1	20%	Week 6
Assignment 2	20%	Week 11
Examination 1	60%	To be advised

Teaching Approach

Lecture and tutorials or problem classes

This teaching and learning approach provides facilitated learning, practical exploration and peer learning.

Feedback

Our feedback to You

Types of feedback you can expect to receive in this unit are:

- Informal feedback on progress in labs/tutes
- Graded assignments with comments
- Solutions to tutes, labs and assignments

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through SETU, Student Evaluation of Teacher and Unit. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, and on student evaluations, see:

<http://www.monash.edu.au/about/monash-directions/directions.html>

<http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html>

Previous Student Evaluations of this unit

If you wish to view how previous students rated this unit, please go to

<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

Required Resources

- Wireshark, Packet Analysis Software freely available from <http://www.wireshark.org/>
- inSSIDder, WiFi Analysis Software freely available from <http://www.metageek.net/products/inssider/>

Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	Overview of Wireless Networks	
2	Ethernet and TCP/IP protocols. Internet.	
3	Electromagnetic waves and antennas	
4	Wireless LAN Technology Fundamentals	
5	Advanced Aspects of WLAN/WiFi Technology	
6	Physical Layer fundamentals	Assignment 1
7	Cellular Wireless Networks. 3G technologies	
8	4G/LTE networks.	
9	WiMax Networks	
10	Mesh and ad hoc Networks	
11	Wireless Personal Area Networks	Assignment 2
12	Wireless Sensor Networks	
	SWOT VAC	No formal assessment is undertaken in SWOT VAC
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your MUSO (Blackboard or Moodle) learning system.

Assessment Requirements

Assessment Policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit

Assessment Tasks

Participation

- **Assessment task 1**

Title:

Assignment 1

Description:

- ◆ Investigate a paper selected from the journals listed below
- ◆ Write a set of PowerPoint presentations that explains details of the findings/results of the paper.
- ◆ Present the paper and answer questions asked by the tutor and students

The list of journals available electronically through Monash Library:

Wireless Networks, Springer
IEEE Wireless Communications
IEEE Communications Magazine
IEEE Transactions on Wireless Communications
IEEE Transactions on Mobile Computing
Journal of Wireless Communications & Mobile Computing (WCMC)
International Journal of Wireless Information Networks
Mobile Computing and Communications Review

Weighting:

20%

Criteria for assessment:

- ◆ Correctness and understanding - there may be more than one "right" answer in many cases.
- ◆ Completeness - that you have answered all parts of each question.
- ◆ Presentation - that you have presented your answers using the appropriate method. Use of evidence and argument - you are able to explain your position by using logical argument.

Due date:

Week 6

• **Assessment task 2**

Title:

Assignment 2

Description:

- ◆ Investigate another paper selected from the journals listed below.
- ◆ Write a set of PowerPoint presentations that explains details of the findings/results of the paper.
- ◆ Present the paper and answer questions asked by the tutor and students

The list of journals available electronically through Monash Library:

Wireless Networks, Springer
IEEE Wireless Communications
IEEE Communications Magazine
IEEE Transactions on Wireless Communications
IEEE Transactions on Mobile Computing
Journal of Wireless Communications & Mobile Computing (WCMC)
International Journal of Wireless Information Networks
Mobile Computing and Communications Review

Weighting:

20%

Criteria for assessment:

- ◆ Correctness and understanding - there may be more than one "right" answer in many cases.
- ◆ Completeness - that you have answered all parts of each question.
- ◆ Presentation - that you have presented your answers using the appropriate method. Use of evidence and argument - you are able to explain your position by using logical argument.

Due date:

Week 11

Examinations

• **Examination 1**

Weighting:

60%

Length:

3 hours

Type (open/closed book):

Closed book

Electronic devices allowed in the exam:

None

Assignment submission

It is a University requirement

(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html>) for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at <http://www.infotech.monash.edu.au/resources/student/forms/>. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an online quiz).

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process:

<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

<http://policy.monash.edu.au/policy-bank/academic/education/index.html>

Key educational policies include:

- Plagiarism
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>)
- Assessment
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-p>)
- Special Consideration
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.h>)
- Grading Scale
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>)
- Discipline: Student Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>)
- Academic Calendar and Semesters (<http://www.monash.edu.au/students/key-dates/>);
- Orientation and Transition (<http://www.infotech.monash.edu.au/resources/student/orientation/>);
and
- Academic and Administrative Complaints and Grievances Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy>)
- Codes of Practice for Teaching and Learning
(<http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-tea>)

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at www.monash.edu.au/students. The Monash University Library provides a range of services and resources that enable you to save time and be more effective in your learning and research. Go to <http://www.lib.monash.edu.au> or the library tab in my.monash portal for more information. Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis

- Website: <http://adm.monash.edu/sss/equity-diversity/disability-liaison/index.html>;
- Telephone: 03 9905 5704 to book an appointment with a DLO;
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1 Gallery Building (Building 55), Monash University, Clayton Campus.