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FIT5083 Wireless networks - Semester 1, 2013

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)

Contact Hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload requirements

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

Dr Phu Dung Le

Campus Lecturer

Caulfield

Phu Dung Le

Consultation hours: Thursday 3pm-5pm
Tutors

Caulfield

Guy Kijthaweesinpoon
Consultation hours: TBA

Minh Vuong
Consultation hours: TBA
Academic Overview

Learning Outcomes

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.
## Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Activities</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No formal assessment or activities are undertaken in week 0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Wired networks with TCP/IP and Introduction to wireless networks</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Wireless networks architectures and communications</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Wireless networks architectures and communications (continued)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Wireless LANs and 802.11 standards</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Wireless WANs with WiMAX</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Wireless Networks Services and Applications</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Wireless Networks Services and Applications (continued)</td>
<td>Assignment 1 due 4pm Friday</td>
</tr>
<tr>
<td>8</td>
<td>Wireless Networks and Security Wireless</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Wireless Network: Design and Implementation</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Ad hoc networks (Wireless Sensor Networks, etc)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Case studies on Wireless Networks</td>
<td>Assignment 2 due 4pm Friday</td>
</tr>
<tr>
<td>12</td>
<td>Revision</td>
<td>No formal assessment is undertaken in SWOT VAC</td>
</tr>
<tr>
<td></td>
<td>SWOT VAC</td>
<td></td>
</tr>
</tbody>
</table>

*Unit Schedule details will be maintained and communicated to you via your learning system.

## Assessment Summary

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

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Value</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>20%</td>
<td>4pm Friday Week 7</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>20%</td>
<td>4pm Friday Week 11</td>
</tr>
<tr>
<td>Examination 1</td>
<td>60%</td>
<td>To be advised</td>
</tr>
</tbody>
</table>
Teaching Approach

Lecture and tutorials or problem classes

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

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

Academic Integrity - Please see the Demystifying Citing and Referencing tutorial at http://lib.monash.edu/tutorials/citing/

Assessment Tasks

Participation

• Assessment task 1

  Title:
  Assignment 1

  Description:

  1. Research on wired and wireless networks: architectures, protocols, topologies, communications and services.
  2. Analyse the advantages and disadvantages of the Monash network.
  3. Present your work in a report and at the interview with your tutor.

  Weighting:
  20%

  Criteria for assessment:

  1. Correctness and understanding
  2. Completeness
  3. Presentation and interview

  Due date:
  4pm Friday Week 7

• Assessment task 2

  Title:
  Assignment 2

  Description:

  1. Carry out your research and practical study on wireless networks in depth.
  2. Practically identify two wireless network vulnerabilities at any layer and setup possible attacks on those two vulnerabilities.
  3. Present your work in a report and demonstrate your practical work to your tutor.

  Weighting:
  20%

  Criteria for assessment:

  1. Correctness and understanding
  2. Completeness
  3. Presentation, demonstration and interview

  Due date:
Examinations

• Examination 1

  Weighting:
  60%

  Length:
  3 hours

  Type (open/closed book):
  Closed book

  Electronic devices allowed in the exam:
  None

Learning resources

Monash Library Unit Reading List
http://readinglists.lib.monash.edu/index.html

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

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:

Returning assignments

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

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).
Online submission

If Electronic Submission has been approved for your unit, please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

Required Resources

Please check with your lecturer before purchasing any Required Resources. Limited copies of prescribed texts are available for you to borrow in the library, and prescribed software is available in student labs.

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

Recommended text(s)


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:


Key educational policies include:

- Plagiarism;  
  http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html
- Assessment in Coursework Programs;  
- Special Consideration;  
  http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.html
- 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/dates/
- Orientation and Transition;  
  http://intranet.monash.edu.au/infotech/resources/students/orientation/
- Academic and Administrative Complaints and Grievances Policy;  
  http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy.html
- Code of Practice for Teaching and Learning;  
- Graduate Attributes Policy  
  http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.html

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 http://www.monash.edu.au/students. For Sunway see http://www.monash.edu.my/Student-services, and for South Africa see http://www.monash.ac.za/current/.

Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to www.lib.monash.edu.au or the library tab in my.monash portal for more information. At Sunway, visit the Library and Learning Commons at http://www.lib.monash.edu.my/. At South Africa visit http://www.lib.monash.ac.za/.
Disability Liaison Unit

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://www.monash.edu/equity-diversity/disability/index.html
Telephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Community Services at 03 55146018 at Sunway
Email: dlu@monash.edu
Drop In: Equity and Diversity Centre, Level 1, Building 55, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Sunway Campus

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 the Student Evaluation of Teaching and Units (SETU) survey. 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, see:
www.monash.edu.au/about/monash-directions and on student evaluations, see:
www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html

Previous Student Evaluations of this Unit

Based on student feedback only one text book has been adopted this semester and the unit has been redesigned to give more focus on wireless concepts.

If you wish to view how previous students rated this unit, please go to https://emuapps.monash.edu.au/unitevaluations/index.jsp