TELE 303/404 – Mobile Systems

Course Outline

Semester 1, 2016

Contents

1 Prerequisite

COMP 160 or INFO 211 & one of TELE 202, COSC 244 and INFO 214 or INFO233

2 Objectives

- Understand the foundations and key techniques for wireless communications and mobile systems.

- Acquire practical skills in applying these techniques and developing wireless networking applications.

This course will expect that a TELE 303/404 student is to develop not only important skills in problem-solving and critical thinking, but also soft skills such as self-assurance, interpersonal communication and teamwork. This includes independently getting familiar with new technologies and working environments (e.g., new IDEs Android Studio) and solving problems by using new knowledge acquired.

3 Topics

Coverage and capacity of mobile networks; radio propagation; data transmission, code division multiple access; medium access control; routing protocols; satellite communications; cellular systems; wireless LANs and local loops; mobile communications systems; and mobile application development.

4 Course Resources

Textbooks

- Beard & Stallings, Wireless Communication Networks and Systems, Prentice-Hall, 2016. [Essential Text]

- Ad hoc Wireless Networks: Architecture and Protocols / C. Siva Ram Murthy and B. S. Manoj. Prentice Hall, 2004. ISBN: 0-13-147023-X.

- Android for Programmers An App-driven Approach / Paul Deitel et al., Prentice Hall, 2012.

Website

The course website is hosted at: `http://www.telecom.otago.ac.nz/tele303/`

This year we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, tutors, and lecturers. Rather than emailing questions to the teaching staff, we encourage you to post your questions on Piazza.

Find our class page at: `http://piazza.com/otago.ac.nz/semester12016/tele303`

5 Timetable

- Lectures: MON/TUE 10:00-10:50, Room: CO429

- Laboratories: WED 10:00-11:50, Room: RAG11

6 Teaching Staff

- Co-ordinator: A/Prof. Jeremiah Deng (Office: CO10.13, Ext.: 8090, email: jeremiah.deng@otago.ac.nz)

- Lecturer: Dr. Tobias Langlotz (Office: CO9.13, Ext.: 8096, email: tobias.langlotz@otago.ac.nz)

- Tutors:

  - Week 1-5, 12: Sepideh Zareei (Office: CO9.08, email: sepideh.zareei@postgrad.otago.ac.nz)
  - Week 6-11: Matthew Cook (email: cooma376@student.otago.ac.nz)

7 Assessment Package

Assessment	Due date	Weight
Labs (x5)	on site	10%
Assignment 1	10am 23/3	10%
Assignment 2	10am 6/4	10%
Project	2pm 22/5	20%
Exam	-	50%

The due dates for assignments are subject to possible minor changes. Please pay attention to announcements in the web forum.

8 Academic Integrity

Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the Universitys Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, taking unauthorised material into a test or exam, impersonation, and assisting someone elses misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the Universitys Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the Universitys Academic Integrity website at `www.otago.ac.`

`nz/study/academicintegrity` or ask at the Student Learning Centre or Library. If you have any questions, ask your lecturer.

9 Coursework Policies

- Students should make sure that all submitted work is their own. Plagiarism is a form of dishonest practice. Plagiarism is defined as copying or paraphrasing anothers work, whether intentionally or otherwise, and presenting it as ones own. Any student found responsible for plagiarism in any piece of work submitted for assessment shall be subject to the Universitys dishonest practice regulations which may result in various penalties.

- Late submissions will be penalized at the standard rate of 10% per day (weekend counted as one day); no submissions will be accepted after seven days beyond the due date. Exceptions to this rule can only be made to applications submitted beforehand to the course coordinator.

- Group work is recommended for the project. In a group work, students may be assessed individually if their contribution or workload is deemed to be unfairly distributed.

10   Schedule

The following schedule is subject to possible changes.

Lecture #	Date	Topic	Tutorial / Laboratory
1	29/2	Mobile computing: overview	
2	1/3	Transmission	
3	7/3	Propagation	Tutorial 1 | Lab 1
4	8/3	Encoding	
5	14/3	Spread spectrum	Tutorial 2 | Lab 2
6	15/3	Medium access control	
7	21/3	MANETs & Routing	Tutorial 3 | Lab 3
8	22/3	TCP performance	
Mid-semester Break			
9	4/4	Mobile Systems overview 1 (History)	Catch-up lab
10	5/4	Mobile Systems overview 2 (Hardware)	
11	11/4	Prototyping mobile apps	Project starts
12	12/4	Android Programming Basics 1 (Introduction)	
13	18/4	Android Programming Basics 2 (Activities)	Lab 4 (1st Milestone)
14	19/4	Android Programming Basics 3 (Events, Intents)	
15	26/4	Android Programming Basics 4 (Data handling)	Lab 5
16	27/4	Android Programming Basics 5 (Threads, NDK)	
17	2/5	Sensors 1	Lab 6 (2nd Milestone)
18	3/5	Sensors 2	
19	9/5	App Distribution / Future of mobile computing	Lab 7
20	10/5	Android Review	
21	16/5	Cellular Wireless Networks	Lab 8 (Final Milestone)
22	17/5	Wireless LANs and PANs	
23	23/5	Satellite Communications	Tutorial 4
24	24/5	Wireless Security	
25	30/5	Wireless Sensor Networks	
26	31/5	Review	