COMS3100/7100

Introduction to Communications

Konstanty Bialkowski

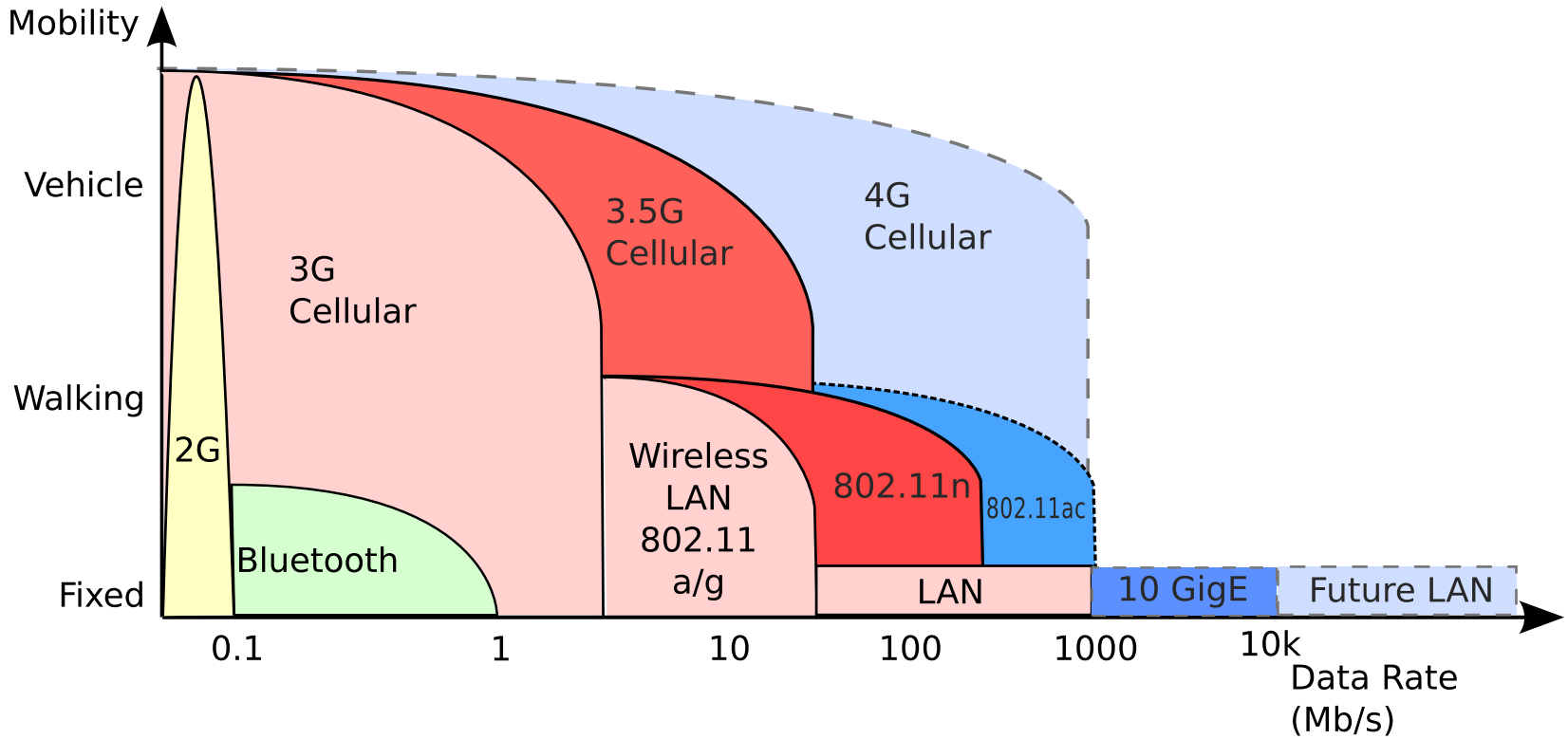
School of Information Technology & Electrical Engineering
The University of Queensland 4072

Email: `ksb@itee.uq.edu.au`

Teaching Staff

- Lecturers
  - A/Prof Andrew Bradley (Co-ordinator)
  - Dr Konstanty Bialkowski
- Contactable via e-mail (see course website)
- Consultation: by appointment (or after the lecture)
- Tutors
  - Tyler Hobson
  - Feng Wang

Why Study Communications?



The Course

 Course Profiles

Outcomes

1. state the operational principles of some typical communication systems
2. understand the roles of and interconnections between basic components of a typical communications system
3. explain the fundamental theories of communication systems

Course Profile (2)

4. apply the theories and methods to solve some simple communication design problems
5. compare the advantages and disadvantages of different communication systems
6. evaluate the performance of and analyse the factors affecting some simple communication systems
7. develop a basic knowledge of communications signal processing and receiver design

Topics

1. Signals and spectra
2. Linear CW Modulaton
3. Exponential CW Modulation
4. Sampling and Pulse Modulation
5. Analogue Communication Systems
6. Information Theory
7. Digital Communication Systems

Course Presentation

- Data projection, OHP, whiteboard, blackboard.
- The examinable content of the course will be defined by the material presented in class.
- Some use will be made of MATLAB demonstrations and animations to illustrate communications concepts.
- Slides and (occasionally) notes and summaries will be available from the *course web page*. The address is

  `http://www.itee.uq.edu.au/ coms3100`

Teaching and Learning Methods

- There are 39 hours of lectures, 12 hours of tutorials and 6 hours of laboratory work ('pracs').
- One of the lecture slots will also be used for a mid-semester exam.
- There will be three prac sessions, each of two hours, to work through the pracs. Make sure you do the preparation before arriving at the practical session.

Assessment

Assessment Programme

- A mid-semester exam in Week 7.
- Three assignments due at the start of Weeks 4, 6 and 10.
- A prac assessment throughput the semester (3 sessions)
- A final exam in the Exam Period.

NOTE:

- If special exam for mid-semester is awarded, will be in the form of a Viva (oral exam) - with 10 Questions worth 2 marks each.

Assessment - Assignments

Type: Problem Set/s - Weight 15%

Due Date: (A1) 21-Mar-11 09:00 + Monday, 9am, of Week 6, 10.
Task Description: Fortnightly tutorial sheets will contain a subset of questions for which solutions will not be provided in tutorial classes. Solutions to these questions are instead to be submitted as assignments. There will be three assignments throughout semester, each worth 5%.
Submission: Assignments are to be submitted through the Faculty of EAIT (Hawken Building 50) assignment chute and require an assignment cover sheet. This is available from:
http://www.eng.uq.edu.au/courses.asp

Assessment - Mid-semester Exam

Type: Exam - Mid Semester During Class - Weight 15%

Due Date: 12-Apr-11

- Perusal: 5 minutes
- Duration: 40 minutes
- Format: Multiple-choice

Task Description: The midsemester examination will be held during the lecture in week 7. You may bring a battery-operated non-programmable calculator. Programmable calculators and other computing or communication devices are not permitted. You will require a HB or 2B pencil and an eraser to complete the examination.

Approved calculators for exams

In some of your courses we will specify that you are only permitted to use an approved **and labelled** calculator in your exam.

How do I know if my calculator is ok to use?
Check if it is on the EAIT Faculty's approved calculator list http://www.eait.uq.edu.au/ (there is also a not-approved list and info on what to do if your calculator is not on either list).

How to I get a label?
Take your calculator to the EAIT Faculty (11am to 3pm weekdays) and they will put a tamper-proof "Approved Calculator" label onto it.

What happens if I don't get a label?
Exam invigilators check for the EAIT label. If you don't have it, then you don't have a calculator for the exam.

Practical Assessment

Type: Laboratory - Weight = 15%

Task Description: Pracical work will be taking place in Hawken laboratories (50-S202). Three scheduled prac sessions will be available during the semester, and students will be asssessed during the practical by the tutors. All prac sheets are available on the COMS3100 website. Preparation must be completed before the prac session before the laboratory session begins.
Marking Criteria: Out of the 15 available marks, each prac session will have marks awarded for preparation (total 2 marks), and completeness and understanding (3 marks). Marks will only be made available via the course website. (NOT directly from tutors during the laboratory session).
NOTE: Optional catch up sessions may be available during weeks 12 and 13 is a need arises.

Assessment - Final Exam

Type: Exam - during Exam Period (Central)
Due Date: Examination Period
Weight: 55%

- Perusal: 10 minutes
- Duration: 180 minutes

Format: Short answer, Short essay, Problem solving
Task Description: The final examination will be held during the final examination period. It is 3 hours and closed book. You may bring a battery-operated non-programmable calculator. Programmable calculators and other computing or communication devices are not permitted.

Assessment - Weighting Summary

Assessment Item	Weighting
3 Assignments	15%.
Mid-semester exam	15%.
Practicals	15%.
Final exam	55%.
Total	

Text Books

- Carlson et al., *Communication Systems: An Introduction to Signals and Noise in Electrical Communication*, McGraw-Hill, 4th ed., 2002.
  - **Prescribed.** The course will follow this text quite closely. Cost: $\sim$ \$110.
- Haykin, *Communication Systems*, Wiley, 4th ed., 2001.
  - **Recommended.** The course will occasionally draw on information from this book. Cost: $\sim$ \$130.

Software

- *MATLAB and SIMULINK Student Version 2007A*, The MathWorks, Inc., 2007.
  - **Recommended.** Full MATLAB software for students — very useful for assignment work. Cost: $\sim$ \$100.
- *GNU Octave*, free alternative to MATLAB available from

  http://www.gnu.org/software/octave/.

Alternative texts

- Haykin & van Veen, *Signals & Systems*, Wiley, 2nd ed., 2002.
  - A good source for the first topic of the course: Signals & Spectra.
- Couch, *Digital & Analog Communication Systems*, Prentice-Hall, 6th ed., 2001.
  - We will sometimes refer to this book.