# *Course Overview*

COMP9336/4336 Mobile Data Networking

Delivered through Moodle

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What is this course about?

- **Concepts, protocols and standards for wireless-mobile data networking**
  - First course in wireless-mobile networking (*no prior knowledge in wireless required*)
  - Assumed knowledge: Introductory course on Computer Networking
- **Coverage of the network protocol stack**
  - PHY layer (introductory coverage of fundamental concepts of wireless communications *without the hard-core maths*): ~20% of the course
  - Data link layer (existing and new developments): ~65%
  - Network layer: ~15%
- **Theory vs. hands-on**

Data Link Layer 65%

Hands-on 45% Theory 55%
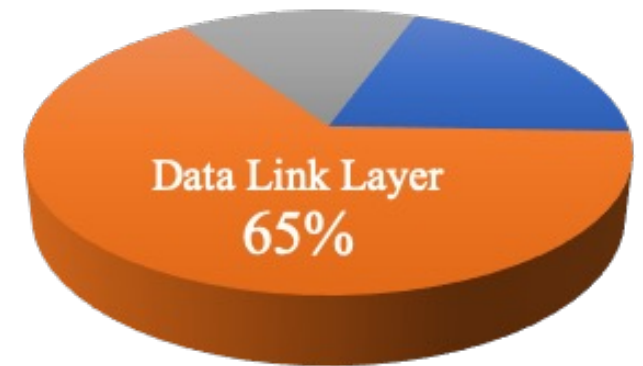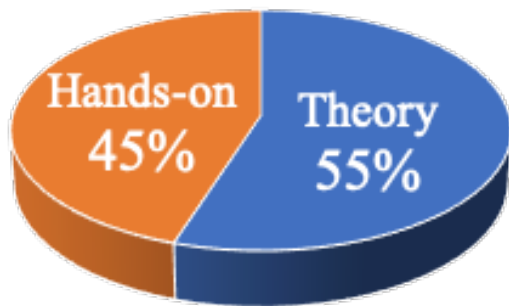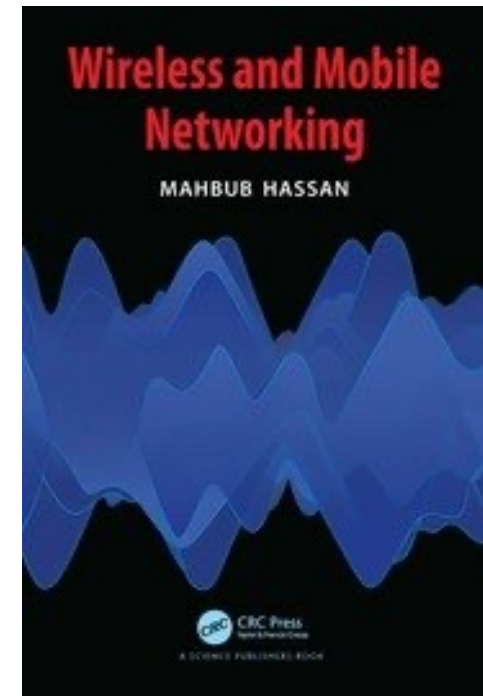
Pre-requisite/Assumed knowledge

- **COMP9331/3331, or any introductory networking course**
    - Protocol Layers: ISO/OSI reference model
    - Physical Layer: Coding, Manchester Coding
    - Packet Transmissions: Preamble, Framing, Bit stuffing, Byte stuffing
    - Error Detection: Parity, Checksum, Cyclic Redundancy Check
    - LANs: Aloha, CSMA/CD, Ethernet, IEEE 802.3
    - LAN Addressing: Unicast vs multicast, Local vs Global
    - Network Layer: Connectionless vs connection oriented, Internet Protocol
- **Basic statistics** (probability, histogram, distribution, etc.)
- **Programming:** Python/C/C++/MATLAB

Syllabus

- Wireless fundamentals: Weeks 1

- WiFi (IEEE 802.11a/b/g/n/ac/ad/ax/be/af/ah/ad/ay): Weeks 2-3

- Cellular fundamentals: Week 4

- Week 5 and Week 6: No Lectures

- Bluetooth (Classic, Smart/Low-Energy, 5.0): Week 7

- Internet of Things, LoRa, LoRAWAN: Week 8

- Wireless sensing (WiFi/Radar): Week 9

- Recap: Week 10

Week-by-week schedule available in Moodle

Textbook

- **Wireless and Mobile Networking, CRC Press, 2022, M. Hassan.**
  - https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780367487355 (print)
  - https://unswbookshop.vitalsource.com/products/-v9781000642803 (digital)
  - UNSW library may offer on-line access plus PDF download for free
- Other References (**not compulsory**)
  - Wireless communications, 2nd Ed, Prentice Hall, 2002, Theodore S. Rappaport (in-depth coverage of wireless "physical layer" with good maths): relevant only for Week 1 lectures

- **Lecturer-in-Charge: Mahbub Hassan (www.cse.unsw.edu.au/~mahbub)**
  - Professor of Computer Networks at UNSW
  - PhD in Computer Networks (Monash University)
  - 30 years of teaching & research experience
  - Winner of UNSW Engineering Teaching Excellence Award
  - Author of the following Computer Networking Books
    - » Wireless and Mobile Networking, CRC Press, 2022
    - » High Performance TCP/IP Networking, Prentice Hall, 2004
    - » Engineering Internet QoS, Artech House, 2002
    - » TCP/IP over ATM Networks, Artech House, 2000

- **Course Admin: Dr. Isura Nirmal**
- **Lab instructors/tutor**

Teaching Team

  - Rui Li (Masters, UNSW): *rui.li@unsw.edu.au*
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Scheduled lectures and labs

- **Lectures are flipped:** **Students are expected to study the prescribed content and watch pre-recorded lectures before attending class. Lecture time is then dedicated to interactions, discussions, problem-solving, quizzes, and other engaging activities.**

- 3-hr-lecture/week for 8 weeks (weeks 1-4, 7-10)
  - Lectures are delivered Mondays 11am-2pm in Colombo A in-person; also live streamed and recorded
  - No lecture on Week 5 due to public holiday
  - No lecture on Week 6 due to Term Recess Week

- 2-hr-lab/week for 8 weeks (wks 2-5, 7-10; wk-1 is self-study lab)
  - Most Labs are in-person (face-to-face)
  - A limited labs may be available for on-line attendance

- **Mid-lecture Moodle quizzes: 15%**
  - 7 weekly Moodle quizzes [best 6 counted; each worth 2.5%]
  - *No extension and no supplementary for missed quiz*
- **Hands-on labs: 20%**
  - 8 experiments [best 5 counted; each worth 4%]
- **Term project (individual): 25%**
- **Final exam: 40%**
  - Open book
  - Expected to be On-campus Invigilated Inspera

Weekly accounting of assessment submissions/activities

Assessment Week	# of activity/ submission	Activity/Submission
Week 1	2	1 lecture + 1 self-study lab (no submission)
Week 2	3	1 lecture+ 1 quiz + 1 lab
Week 3	3	1 lecture+ 1 quiz + 1 lab
Week 4	3	1 lecture+ 1 quiz + 1 lab
Week 5	1 (No Lecture, no quiz)	1 lab
Week 6	NONE	NONE
Week 7	3	1 lecture+ 1 quiz + 1 lab
Week 8	3	1 lecture+ 1 quiz + 1 lab
Week 9	4	1 lecture+ 1 quiz + 1 lab + 1 project
Week 10	3	1 lecture+ 1 quiz + 1 lab
Week 11-13	1	Final exam
	Total=26	

Final Grade

- All four assessment components, *quiz*, *lab*, *project*, and *final exam*, are added to produce your final score

- However, final exam is a *hurdle* exam.

- Students must score at least 40% in the final exam to be *eligible* to pass the course. To successfully pass the course, students must achieve at least 40% in the final exam *and* a combined overall grade of 50% across all assessment components.

Progress Feedback Opportunities

- Weekly feedback through quizzes and labs
  - Weeks 1-5, 7-10 for quizzes
  - Weeks 2-5, 7-10 for labs
- Additional on-demand feedback through Ed Forum
- Face-to-face 1-on-1 consultation with lecturer

To sum up

- Cutting-edge knowledge in wireless and mobile networking
- Good mix of theory and hands-on experience
- Ample opportunities for interaction with the lecturer and fellow students during class (flipped lecture)
- On-going feedback on learning progress