Department of Computer Science and Engineering
Faculty of Engineering, University of Moratuwa

CS4492 Wireless and Broadband Networking
2013 Batch Semester 7 (Feb – June 2017)

Class LMS	http://online.mrt.ac.lk/course/view.php?id=6876
Schedule	Wednesday 1:15pm - 3:15pm at CSE Dept. (14 sessions)
Instructor	Dr. Dilum Bandara, dilumb@cse.mrt.ac.lk, 011-265-0152
Prerequisite(s)	None. However, students are recommended to have a background on fundamentals of data communication and computer networks, programming, and related mathematics. This background should include a working knowledge on principles of communications, LAN, WAN, data link layer, TCP/IP, and network services.
Text	Wireless Networking Complete by P. Zheng et al., 2009, Morgan Kaufmann, ISBN: 9780123750778 Other readings: • Wireless Communications and Networking by Vijay K. Garg, The Morgan Kaufmann Series in Networking • Wireless Networking by Anurag Kumar, D. Manjunath, and Joy Kuri, The Morgan Kaufmann Series in Networking • Relevant research papers
Assessment	Distribution of marks are as follows: • Project — 30% • Homework (2) — 10% (5 × 2) • Quizzes (2) — 10% (5 × 2) • Final Exam (2 hours, open book) — 50% In a group of 2 to 4, students will do an approved project relevant to the material covered in the class. The details will be provided.
Course Objectives	To provide a broader understanding of wireless and broadband technologies, services, their designs, and applications. At the end of the module, you will be able to explain wired and wireless broadband technologies, standards, and services. Moreover, you will be able to identify issues in existing networks in small to medium-size organizations, and will apply those technologies to overcome identified issues by designing, selecting, justifying, and developing appropriate solutions. Required readings, project, in-class presentations (related to project), and discussions will enhance both the analytical and soft skills.

Syllabus	The goal for the class is to be broad rather than deep with an emphasis on wireless and broadband services and applications. Our plan is to touch upon the following areas. Following is a tentative list of topics that might be covered in the class; we will select material adaptively based on the background, interests, and progress of the students.
	1. Introduction to Wireless Communications [2 classes]
	   • Radio waves and wireless signal encoding techniques
	   • Wireless networking issues and constraints
	   • Wireless internetworking devices
	2. Wireless Personal Area Networks (WPANs) [2 classes]

- Bluetooth, ZigBee, and high speed WPANs
- Near-Field Communication (NFC), RFID
3. Wireless Local Area Networks (WLANs) [2 classes]
   - IEEE 802.11 standard
   - WLAN planning, configuration, and troubleshooting
   - Management and security
4. Wireless Metropolitan Area Networks (WMANs) [2 classes]
   - Last mile connections to the Internet
   - Fixed and mobile WiMAX, 3G, 4G (LTE and LTE advanced)
   - Security
5. Wireless Sensor Networks (WSNs) [2 classes]
   - IEEE 802.15.4 standard
   - Sensor network design, WSN applications
   - Routing, data fusion, clustering
   - Internet of Things (IoT)
   - Vehicular Networks
   - Security
6. Fixed Broadband Technologies [2 classes]
   - xDSL, ATM
7. Services and QoS [2 classes]
   - Mobile IP, VoIP, mobile IPTV, mobile social networking, location-based services

Workload Expectations

There is a normative workload expected of you while following this module. This is a 3-credit module. For the average student, this means 135 study hours over the semester. The following table provides a rough breakdown of how these hours might be spent over the whole semester – but this is only for guidance:

Attendance	
2 hour lectures × 15 weeks	30
Independent work	
Preparatory work – e.g., set reading, checking LMS announcements, preparation for lectures, independent work for project 4 hours a week × 15 weeks	60
Homework (4 hours × 2)	8
Group work	
Project – performed in stages, 2-4 students per group	35
Assessment	
Exams Quizzes are included in lecture slots	2
TOTAL	**135**

Class Policies

- Topics to be discussed in each class will be posted on Moodle, along with relevant readings for each topic. You are expected to keep up with the readings as we go, as they will help provide the foundation for the homework, quizzes, and exam. Impromptu quizzes will be based on these assigned readings.
- All students are expected to actively participate in class and Moodle activities. Poor participation and/or poor performance in assigned course work can be grounds for failure in the course.

- University rule of 80% attendance will be strictly enforced.
- Discussing and exchanging ideas through study groups are encouraged, as this usually leads to a better depth of understanding. As part of the discussions, you may share ideas and thoughts, discuss the meaning of homework questions, or possible ways of approaching a solution. However, you must write homework solutions strictly. If one of your solutions is based on a key idea of someone else, you must acknowledge this in your homework, to avoid the perception of cheating. This form of collaboration is not an opportunity to copy answers from others.
- Group assignments are given to encourage team work and discussion/toleration of alternative ideas/views; hence, they need to be done as a group. A penalty will be enforced for doing group assignments individually.
- Plagiarism, copying another person's work, letting another person copy your work, giving or receiving aid during any test or examination is all strictly not allowed. Any student caught in any of these will receive a failing grade regardless of marks earned on other assessed work.
- Proper netiquette should be observed in using the Moodle.
- Each assigned work will have either a deadline for submission or a specific date for performance. For each day delayed beyond a deadline, 10% of marks will be deducted. Not performing (e.g., not doing a presentation) on an assigned date will result in 0 marks unless there is a valid reason and another student/group is arranged as a replacement. Details of submission will be given with each assignment. All assignments must be submitted via the Moodle.
- The dictionary meaning of deadline is "the latest time or date by which something should be completed". Thus, as you may already experience during your internship, deadlines are supposed to be met.
- All quizzes are closed book and closed note. Final exam is open book. The final exam will be comprehensive, covering material from the entire course including in class and Moodle discussions.
- You may not use cell phones, mp3 players, etc., during the class. All laptops, smart phones, and tablets must be closed, unless you use it to take notes or search for additional contents relevant to the ongoing class discussion. The reason is to prevent distractions to other students, and to prevent the temptation to check email, Facebook, etc.