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

## CS4482 High Performance Networking

2009 Batch Semester 8 (Oct 2013 - Jan 2014)

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| Class LMS | http://online.mrt.ac.lk/course/view.php?id=204 |
| Schedule | Wednesdays between 3:15pm – 5:15pm at CSE Dept. (15 sessions) |
| Instructors | Dr. Dilum Bandara, dilumb@cse.mrt.ac.lk, 0112 640 387, Ext. 6022 |
| Prerequisite(s) | CS3032, CS3412<br>Good background in networking, algorithms, data structures, programming, linear algebra, and statistics is essential. |
| Text | Primarily based on relevant research papers. |
| Assessment | Distribution of marks is as follows:<br>• Project 25%<br>• Research paper based on outcomes of project 15%<br>• Participation (class and LMS) 10%<br>• Final Exam (2 hour, closed book) 50% |
| Course Objectives | To provide an in-depth understanding of advanced and high performance networking technologies, their designs, algorithmic techniques, and applications.<br>At the end of the module, you will be able to explain advanced concepts and theories in networking, apply them to solve a constrained problem, understand its performance and limitations, and implement it. You will also present the findings after conducting research in an assigned area in networking. Required readings, project, discussions, paper writing will enhance both the analytical and soft skills. |
| Syllabus | We will start with some fundamental design decisions for the Internet and then dive into more recent topics that are expected to have a profound impact in the coming years. The goal for the class is to be deep than broad. Our plan is to touch upon the following areas. This 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.<br>1. End-to-end argument<br>2. Emerging networks<br>  • Content Centric Networking (CCN)<br>  • Overlay and P2P networks<br>  • Content delivery networks<br>3. Advanced/enhanced protocols<br>  • TCP variants<br>  • Protocols for fast delivery of volumes of data<br>4. Topologies and protocols for datacenters and clouds<br>  • Fat trees<br>  • Software-defined networks<br>5. QoS, replication, fault tolerance, and traffic management |

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:

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| **Attendance** | |
| 15 weeks × 2 hour lectures | 30 |
| **Independent work** | |
| Preparatory work – e.g., set reading, checking LMS announcements, preparation for lectures. 15 weeks × 3 hours a week | 45 |
| **Group work** | |
| Project | 40 |
| Research paper | 18 |
| **Assessment** | |
| Exams | 2 |
| **TOTAL** | **135** |

Class policies

- Topics to be discussed in each class will be posted on LMS, 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 LMS activities. Poor participation and/or poor performance in assigned course work can be grounds for failure in the course.
- 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.
- 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 LMS.
- 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 LMS.
- All quizzes and final exam will be closed book and closed note exams. The final exam will be comprehensive, covering material from the entire course including student presentations.
- You may not use cell phones, mp3 players, etc. during class. All laptops must be closed and all computer screens of the computers in the classroom must be turned off 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 e-mail/Facebook/etc.