

Advanced Distributed Systems

Syllabus Information

CS 4860 - Advanced distributed systems

Associated Term: 2024/25 Academic Session

Learning Objectives:

The course will cover fundamental principles of building modern distributed systems, for example in the context of the Internet of Things. The specific emphasis will be on the two central components of the IoT reference architecture: cloud infrastructure and wireless networking. The course will discuss major challenges found in these environments (such as massive scales, wide distribution, decentralisation, unreliable communication links, component failures and network partitions) and general approaches for dealing with these challenges. The topics covered will include: abstract models (such as the synchronous and asynchronous distributed computing models, models for wireless networks); algorithmic techniques (such as distributed coordination, fault-tolerant design of distributed algorithms, synchronization techniques); practical case studies. The students will also have an opportunity to apply the studied material for implementing various components of a realistic distributed system through a series of formative coursework assignments, lab practicals, and a final project. **Learning Outcomes:** 1. Display a mastery of core concepts, theories and principles of distributed systems 2. Demonstrate knowledge of algorithmic techniques for solving problems in a distributed environment. 3. Explain the practical aspects of implementing various components of a distributed system 4 Implement various components of a realistic distributed system. 5. Think critically about open research problems

Required Materials: [Click here for the reading list system](#)

Technical Requirements: The total number of notional learning hours associated with course are 150. **These will normally be broken down as follows:** 20 hour(s) of Lectures across 10 week(s) 20 hour(s) of Laboratory classes 110 hour(s) of Guided Independent Study **Formative Assessment:** Feedback during the lab sessions **Summative Assessment:** Examination (70%) 2 hours Coursework (30%) 25 hours