# COURSE DETAIL

| NETWORK ARCHITECTURE AND PERFORMANCE |
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| **Country**<br>Sweden |
| **Host Institution**<br>Lund University |
| **Program(s)**<br>Lund University |
| **UCEAP Course Level**<br>Upper Division |
| **UCEAP Subject Area(s)**<br>Computer Science |
| **UCEAP Course Number**<br>143 |
| **UCEAP Course Suffix** |
| **UCEAP Official Title**<br>NETWORK ARCHITECTURE AND PERFORMANCE |
| **UCEAP Transcript Title**<br>NETWORK ARCHITECTUR |
| **UCEAP Quarter Units**<br>6.00 |
| **UCEAP Semester Units**<br>4.00 |

**Course Description**
The course gives a deep understanding of principles, functions, and techniques that form the foundation of communication networks with an emphasis on wireless communication systems. In particular, the course covers these functions' behavior and performance based on the stochastic nature of the data streams in modern communication networks. The course covers both public systems (3G, LTE) and technologies for wireless local networks (WLAN, Ad-Hoc, and mesh networks). The course gives an understanding of how these systems integrate more and more, advantages and disadvantages, as well as problems and their solutions in connection with this integration. The courses also discusses current and future trends in network systems such as Internet of Things and Tactile Internet, and the enabling technologies being developed for them. The course structure contains lectures and exercises, as well as a lab on network simulation and data analysis. Further, students complete a group-based system design project. The course is divided into the following modules: review of probability, stochastic processes and basic computer networking; medium access control using reservation schemes and random access schemes; network architectures for licensed and unlicensed spectrum; modelling for performance analysis; traffic management: queueing systems and congestion and flow control. The following systems and technologies are covered: cellular systems (GSM, UMTS, LTE and a discussion of 5G); MAC protocols: ALOHA, CSMA, 802.11 (WiFi), including the Bianchi model of 802.11; congestion and flow control techniques such as Random Early Detection, token bucket schemes; queueing disciplines such as priority queueing, weighted fair queueing, class based queueing TCP flow and congestion control and retransmission strategies.

**Language(s) of Instruction**
English

**Host Institution Course Number**
ETSN10

**Host Institution Course Title**
NETWORK ARCHITECTURE AND PERFORMANCE

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| **Host Institution Campus**<br>Engineering |
| **Host Institution Faculty** |
| **Host Institution Degree** |
| **Host Institution Department**<br>Engieering - Electrical and Information Technology |

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