

Communications Engineering

Basic information

Sivuaine suomeksi: Tietoliikennetekniikka

Biämne på svenska: Datakommunikationsteknik

Code: ELEC3032

Extent: 20 credits

Language: English

Professors in charge: Riku Jäntti, Heikki Hämmäinen

Target group: All students with sufficient prerequisite knowledge.

Application procedure: No separate application procedure.

Prerequisites: Minor in Informationstechnology or preliminary courses of the selected courses or equivalent knowledge. Required preliminary knowledge varies depending on the selected courses.

Content and structure of the minor

Students taking the Communications Engineering minor are given lots of choice in selecting different topics inside the broad field of Communications Engineering. Students are equipped to develop a deep understanding of Internet Technologies, Wireless Technologies and Communications Ecosystems, and upon completing the minor will be able to apply their new knowledge and skills for practical situations and actual cases.

The courses related to Internet Technologies provide a solid basis for understanding the design principles, theory and practice of the core technologies and protocols of the Internet, both in wireless and fixed network communication. As well as offering a solid theoretical background, many courses also involve practical projects that deal with the current state-of-the-art Internet protocols and applications.

The courses related to Wireless Communications focus on various techniques of physical, link and network layers utilized in modern wireless communication systems, as well as the methods used to design, evaluate and deploy them.

The courses related to Communications Ecosystems offer education in the areas of technology, economics, and user behavior in the context of communications networks and services. Students learn multiple skills and systems-thinking, and will be able to collaborate with experts from other fields such as economics, sociology or design.

| Code | Name | Credits | T e a c h i n g p e r i o d |
|--|--|---------|--|
| Choose at least one of the following courses | | | |
| ELEC-E7130 | Internet Traffic Measurements and Analysis | 5 | I |
| ELEC-E7120 | Wireless Systems | 5 | I |
| Choose to fulfill 20 credits * | | | |
| * Check the prerequisites! | | | |
| ELEC-E7240 | Coding Methods P | 5 | III |
| ELEC-E7210 | Communication Theory | 5 | I- II |

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| ELEC-E7410 | Communication Transmission Lines | 5 | S u m m e r p e r i o d |
| ELEC-E7851 | Computational User Interface Design | 5 | II |
| ELEC-E5422 | Convex Optimization I P | 5 | I |
| ELEC-E5423 | Convex Optimization II P | 5 | II |
| ELEC-E7470 | Cybersecurity P | 5 | V |
| ELEC-D7010 | Engineering for Humans | 5 | V |
| ELEC-E7320 | Internet Protocols | 5 | III - I V |
| ELEC-E7250 | Laboratory Course in Communications Engineering | 5 | III - V |
| ELEC-E7330 | Laboratory Course in Internet Technologies | 5 | I- II |
| ELEC-E7260 | Machine Learning for Mobile and Pervasive systems P | 5 | II - III |
| ELEC-E7230 | Mobile Communication Systems | 5 | I |
| ELEC-E7460 | Modelling and Simulation P | 5 | I- II |
| ELEC-E7420 | Network Service Provisioning P | 5 | III - IV |
| ELEC-E7820 | Operator Business | 5 | I |
| ELEC-E7810 | Patterns in Communications Ecosystems | 5 | I V - V |
| ELEC-E7450 | Performance Analysis P | 5 | V |
| ELEC-E7880 | Quality of Experience | 3 | I- II, III - I V |
| ELEC-E7220 | Radio Resource and Spectrum Management P | 5 | I V - V |
| ELEC-E7861 | Research Project in Human-Computer Interaction P | 5-10 | III - I V |
| ELEC-E7310 | Routing and SDN | 5 | II - III |
| ELEC-E5410 | Signal Processing for Communications | 5 | I- II |

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| ELEC-E7910 | Special Project in Communications Engineering | 2-10 | I, II, III ; I V ; V |
| ELEC-E5440 | Statistical Signal Processing | 5 | I- II |
| ELEC-E7890 | User Research P | 5 | I |
| ELEC-E7830 | Value Network Design for Internet Services | 5 | III - I V |
| ELEC-E9900 | Networked Partnering and Product Innovation – NEPPI Tech | 5 | II |