



Master's Programme in

Information and Network Engineering

Do you know your wireless communications, networking, and data analysis? We live in an increasingly on-line world, where not only people but also an increasing number of different machines and sensors are connected. Digitalization of society and industry is discussed daily, including concepts such as Internet of Things, smart homes, the Smart Grid and autonomous vehicles.

To maintain and develop the high-tech industry around the world, engineers are needed who can both understand and develop communication solutions as well as having the methods to analyse and process the huge amounts of information that flow in various networks. To an increasing degree, this need will also be felt outside the traditional information and communications technology sector. Examples include the new sector of companies based on cloud services as well as more traditional man-

ufacturing industry and the motor vehicle industry, to mention a few.

This programme will prepare you for a future professional role by providing you with a broad basis and the opportunity for in-depth studies in the following areas:

- Communications engineering
- Information engineering
- Multimedia processing and analysis
- Networked systems

In addition to the technical aspects of the coursework, there are also many non-technical classes offered, such as project management and leadership, and technical English.

DEGREE PROJECT

The degree project amounts to one semester of full-time work and is normally undertaken during the last semester. The project is carried out in the area defined by and relevant to the courses taken during the programme. The project may be undertaken in either an industry setting, at a KTH department, or in another technical university or research institute anywhere in the world.

Examples of degree project made by former students:

- Automated cyber security compliance assessment
- Data analytics optimization for mobile networks, based on divisible load theory
- Performance of In-Band Full-Duplex for 5G Wireless Networks
- Object ranking for mobile 3D visual search
- Solving Sudoku by sparse signal processing

CAREER PROSPECTS

The Information and Network Engineering master programme has been designed to provide a broad basis in the strongly connected fields of networking, communication, multimedia processing and computing, with the opportunity of gaining expertise of one of these areas. The program prepares for a future professional role in research and development. There are many companies in the Stockholm area working with traditional telecommunication technologies, as well as in the emerging areas of internet of things, cloud computing or industry digitization. A majority of graduates find work in research and development at companies in the field of communications and digitalization. Elective courses with strong

theoretic content in the fields of networking and information engineering benefit students with interest in future research career, and give a good basis for Ph.D. studies in Sweden or abroad.

Information and Network Engineering will continue to be pivotal in how our societies operate, and KTH will play an important role by providing the talent and creativity for the future.

Examples of companies were former students work: Google, Skype, Ericsson, Huawei technologies, Telia company, Nokia, ÅF, Cisco, ABB, Avida finans and Scania

FACULTY AND RESEARCH

The programme in Information and Network Engineering is given by the School of Electrical Engineering and Computer Science at KTH. The area of Telecommunication Engineering at KTH is ranked 20th in the world by Academic Ranking of World Universities (ARWU), the Shanghai ranking. The field of Electrical and Electronics at KTH is currently ranked 26th in the world by QS (17th in 2016, 16th in 2015). Faculty from the departments in Information Science and Engineering, and Network and Systems Engineering, is teaching courses within this programme, and all teachers are also active researchers in the area.

COURSES

The programme has mandatory and recommended courses for all students. Besides those courses all students choose to follow a specific track with a set of mandatory and conditionally elective courses.

The tracks are: Communications engineering, Information engineering, Multimedia processing and analysis, and Networked systems.

In addition to that the programme has around 30 credits for courses of your own choice.

CONTACT

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READ MORE AND GET IN CONTACT WITH THE STUDENT AMBASSADORS

www.kth.se/studies

		YEAR	CREDITS	1	2	3	4
MANDATORY: ALL TRACKS							
EP2120	Internetworking	1	7.5	x			
EQ1220	Signal Theory*	1	7.5	x			
EQ2222	The Sustainable ... Engineer	1-2	3.0	x	x	x	x
EQ2310	Digital Communications	1	9.0		x	x	
AK2036	Theory and Methodology of Science with Applications	1	7.5				x
RECOMMENDED COURSES							
LS1465	Rhetoric - Speaking and Writing for Impact	1	7.5			x	
LS2439	English for Writing and Presenting a Degree Project	1	7.5			x	
AK1213	Swedish Society, Culture and Industry in Historical Perspective	1	7.5			x	x
LS1502	Swedish A1 for Engineers	1	7.5			x	x
LS2429	Technical Communication in Eng.	1	7.5				x
EH2720	Management of Projects	1	7.5	x			
ME1003	Industrial Management	1	6.0	x			
DD2423	Image Analysis and Computer Vision	1	7.5		x		
EP2500	Networked Systems Security	1	7.5		x		
EQ2300	Digital Signal Processing	1	7.5		x		
EQ2330	Image and Video Processing	1	7.5		x		
ID1018	Programming I	1	7.5		x		
ID1212	Network Programming	1	7.5		x		
EP2200	Queuing Theory and Teletraffic Systems	1	7.5			x	
EP2520	Building Networked Systems Security	1	7.5			x	
EQ2321	Speech and Audio Processing	1	7.5			x	
EQ2401	Adaptive Signal Processing	1	7.5			x	
EQ2411	Advanced Digital Communications	1	7.5			x	
EQ2845	Information Theory and Source Coding	1	7.5			x	
EQ2871	Cyber-Physical Networking	1	7.5			x	
IK2217	Advanced Internetworking II	1	7.5			x	
EQ2461	Seminars in Information and Network Engineering	1	3.0			x	x
EH2770	IT Management with Enterprise Architecture I	1	7.5				x
EI2400	Applied Antenna Theory	1	7.5				x
EP2950	Wireless Networks	1	7.5				x
EQ2341	Pattern Recognition and Machine Learning	1	7.5				x
EQ2840	Information Theory and Channel Coding, Accelerated Prog.	1	7.5				x
IK2220	Software Defined Networking (SDN) and Network Functions Virtualization (NFV)	1	7.5				x
SF2822	Applied Nonlinear Optimization	1	7.5				x
IK2213	Network Services and Internet-based Applications	1	7.5				
EQ2425	Analysis and Search of Visual Data	1-2	7.5	x			
EQ2801	Optimal Filtering	1-2	7.5	x			

*Not for students from Electrical Engineering at KTH.

		YEAR	CREDITS	1	2	3	4
EQ2831	Foundations in Digital Com.	1-2	7.5		x		
ME2089	Leadership in Cross-Cultural and Industrial Contexts	1-2	6.0		x		
EL2745	Principles of Wireless Sensor Networks	1-2	7.5	x			
EN2720	Ethical Hacking	1-2	7.5	x			
EP2210	Performance Analysis of Communication Networks	2	7.5	x			
EP2300	Management of Networks and Networked Systems	2	7.5	x			
EQ2415	Machine Learning and Data Sci.	2	7.5	x			
IK2510	Wireless Networks	2	7.5	x			
SF2935	Modern Methods of Statistical Learning	2	7.5	x			
EH2781	IT Management with Enterprise Architecture II, Case Studies	2	15.0	x	x		
DD2434	Machine Learning, Adv. Course	2	7.5		x		
EP2420	Network Analytics	2	7.5		x		
EP2510	Advanced Networked Systems Security	2	7.5		x		
EQ2443	Project in Information Eng.	2	7.5		x		
EQ2444	Project in Communication Eng.	2	7.5		x		
EQ2445	Project in Multimedia Processing and Analysis	2	7.5		x		
IK2511	Project in Wireless Networks	2	7.5		x		
IK2514	Wireless Infrastructure Deployment & Economics	2	7.5		x		
LS1419	English for Employment	2	7.5		x		
LS1465	Rhetoric - Speaking and Writing for Impact	2	7.5	x			
LS2429	Technical Communication in Eng.	2	7.5	x			
AK1213	Swedish Society, Culture and Industry in Historical Perspective	2	7.5	x	x		
LS1502	Swedish A1 for Engineers	2	7.5	x	x		
LS2439	English for Writing and Presenting a Degree Project in Science and Engineering	2	7.5		x		

SPECIALISATIONS

TRACK: COMMUNICATIONS ENGINEERING

MANDATORY

EQ2300	Digital Signal Processing	1	7.5		x		
EQ2411	Advanced Digital Communications	1	7.5			x	
EP2950	Wireless Networks	1	7.5				x
EQ2444	Project in Communication Eng.	2	7.5		x		

RECOMMENDED

EQ2831	Foundations in Digital Communications	1-2	7.5		x		
EP2200	Queuing Theory and Teletraffic Systems	1	7.5			x	

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EQ2845	Information Theory and Source Coding	1	7.5			x	
EQ2871	Cyber-Physical Networking	1	7.5			x	
EI2400	Applied Antenna Theory	1	7.5				x
EQ2840	Information Theory and Channel Coding, Accelerated Program	1	7.5				x

TRACK: INFORMATION ENGINEERING

MANDATORY

EQ2300	Digital Signal Processing	1	7.5		x		
EQ2401	Adaptive Signal Processing	1	7.5			x	
EQ2341	Pattern Recognition and Machine Learning	1	7.5				x
EQ2443	Project in Information Engineering	2	7.5		x		

RECOMMENDED

EQ2801	Optimal Filtering	1	7.5	x			
EQ2845	Information Theory and Source Coding	1	7.5			x	
EQ2840	Information Theory and Channel Coding, Accelerated Program	1	7.5				x
EQ2415	Machine Learning and Data Science	2	7.5	x			
EQ2801	Optimal Filtering	2	7.5	x			
SF2935	Modern Methods of Statistical Learning	2	7.5	x			
DD2434	Machine Learning, Adv. Course	2	7.5		x		

TRACK: MULTIMEDIA PROCESSING AND ANALYSIS (MMB)

MANDATORY

EQ2330	Image and Video Processing	1	7.5		x		
EQ2321	Speech and Audio Processing	1	7.5			x	
EQ2341	Pattern Recognition and Machine Learning	1	7.5				x
EQ2445	Project in Multimedia Processing and Analysis	2	7.5		x		

RECOMMENDED

EQ2425	Analysis and Search of Visual Data	1	7.5	x			
EQ2801	Optimal Filtering	1	7.5	x			
DD2423	Image Analysis & Computer Vision	1	7.5		x		
EQ2300	Digital Signal Processing	1	7.5		x		
EQ2845	Information Theory and Source Coding	1	7.5			x	
EQ2415	Machine Learning and Data Science	2	7.5	x			
EQ2425	Analysis and Search of Visual Data	2	7.5	x			
EQ2801	Optimal Filtering	2	7.5	x			

		YEAR	CREDITS	1	2	3	4
TRACK: NETWORKED SYSTEMS							
At least one of the courses EP2520, EP2420 and IK2213 must be chosen for the degree.							
MANDATORY							
EP2500	Networked Systems Security	1	7.5		x		
EP2200	Queuing Theory and Teletraffic Systems	1	7.5			x	
EP2950	Wireless Networks	1	7.5				x
CONDITIONALLY ELECTIVE							
EP2520	Building Networked Systems Security	1	7.5			x	
EP2420	Network Analytics	2	7.5		x		
RECOMMENDED							
EN2720	Ethical Hacking	1-2	7.5	x			
EH2770	IT Management with Enterprise Architecture I	1	7.5				x
IK2220	Software Defined Networking and Network Functions Virtualization (NFV)	1	7.5				x
EP2210	Performance Analysis of Communication Networks	2	7.5	x			
EP2300	Management of Networks and Networked Systems	2	7.5	x			
EP2510	Advanced Networked Systems Security	2	7.5		x		
EH2781	IT Management with Enterprise Architecture II, Case Studies	2	15.0	x	x		