



# Programme syllabus

[An accessible version of the syllabus can be found in the Course and programme directory.](#)

## Degree Programme in Computer Science and Engineering 270 credits

Civilingenjörsutbildning i datateknik

*Valid for students admitted to the education from autumn 04 (HT - Autumn term; VT - Spring term).*

This is a translation of the Swedish, legally binding, programme syllabus.

# Programme objectives

Knowledge and understanding

Skills and abilities

Ability to make judgements and adopt a standpoint

Extent and content of the programme

Eligibility and selection

Implementation of the education

Courses

The programme is course-based. Lists of courses are included in appendix 1.

Grading system

Courses in the first and the second cycle are graded on a scale from A to F. A-E are passing grades, A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions



# Appendix 1: Course list

## Degree Programme in Computer Science and Engineering (D)

### General courses

#### Year 1

#### Mandatory courses (60.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2D1345</a>	Introduction to Computer Science	16.5 hp	
<a href="#">2D1347</a>	Communication	6.0 hp	
<a href="#">2H1340</a>	Electrical Circuits	9.0 hp	
<a href="#">5B1104</a>	Calculus I, part 1	7.5 hp	
<a href="#">5B1105</a>	Calculus I, part 2	7.5 hp	
<a href="#">5B1109</a>	Linear Algebra II	7.5 hp	
<a href="#">5B1928</a>	Logic	6.0 hp	

#### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2E1215</a>	Introductory Matlab Course	1.5 hp	
<a href="#">5B1111</a>	Complementary Course in Calculus	3.0 hp	

## Year 2

### Mandatory courses (54.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2D1240</a>	Numerical Methods, Basic Course II	6.0 hp	
<a href="#">2D1350</a>	Programming Paradigms	6.0 hp	
<a href="#">2D1352</a>	Algorithms, Data Structures and Complexity	9.0 hp	
<a href="#">5B1200</a>	Differential Equations and Transforms I	6.0 hp	
<a href="#">5B1204</a>	Discrete Mathematics	12.0 hp	
<a href="#">5B1506</a>	Mathematical Statistics, Basic Course	9.0 hp	
<a href="#">5C1105</a>	Insights in Mechanics - Modelling and Simulation	6.0 hp	

### Conditionally elective courses

Code	Name	Credits	Edu. level
<a href="#">5A1232</a>	Optical Communication and Imaging	6.0 hp	
<a href="#">5A1242</a>	Physics of Microcosmos	6.0 hp	

## Year 3

### Mandatory courses (27.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2D1954</a>	Program Development Project	6.0 hp	
<a href="#">2G1502</a>	Computer Hardware Basics	6.0 hp	
<a href="#">2I1100</a>	Information Systems and Database Technology	9.0 hp	
<a href="#">4D1091</a>	Work Environment, Computers and Business Administration	6.0 hp	

## Conditionally elective courses

Code	Name	Credits	Edu. level
<a href="#">3C1320</a>	Environment and Technology	6.0 hp	
<a href="#">3C1330</a>	Technology and Ecosystems	6.0 hp	

## Year 4

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2A1170</a>	Chaos and Self-organization	6.0 hp	
<a href="#">2D1220</a>	Applied Numerical Methods I	6.0 hp	
<a href="#">2D1225</a>	Numerical Solutions of Differential Equations	6.0 hp	
<a href="#">2D1250</a>	Applied Numerical Methods II	9.0 hp	
<a href="#">2D1255</a>	Numerical Solutions of Differential Equations	7.5 hp	
<a href="#">2D1257</a>	Visualization	6.0 hp	
<a href="#">2D1258</a>	Introduction to High Performance Computing	7.5 hp	
<a href="#">2D1260</a>	The Finite Element Method	6.0 hp	
<a href="#">2D1263</a>	Program Construction for Scientific Computing	6.0 hp	
<a href="#">2D1266</a>	Mathematical Models, Analysis and Simulation Part 1	7.5 hp	
<a href="#">2D1269</a>	Mathematical Models, Analysis and Simulation, part 2	7.5 hp	
<a href="#">2D1272</a>	Computational Physics	7.5 hp	
<a href="#">2D1285</a>	Numerical Algorithms for Parallel Computers	6.0 hp	
<a href="#">2D1290</a>	Advanced Numerical Analysis	6.0 hp	
<a href="#">2D1365</a>	Overview of Human-computer Interaction	6.0 hp	
<a href="#">2D1370</a>	Functional Programming	6.0 hp	
<a href="#">2D1373</a>	Artificial Languages and Syntax Analysis	6.0 hp	
<a href="#">2D1375</a>	Implementation of Programming Languages	6.0 hp	
<a href="#">2D1378</a>	Text and Image Processing	6.0 hp	
<a href="#">2D1381</a>	Industrial Applications of Artificial Intelligence	6.0 hp	
<a href="#">2D1387</a>	Program System Construction Using C++	6.0 hp	

2D1390	Internet Programming	6.0 hp	
2D1392	Protocols and Principles of the Internet	7.5 hp	
2D1406	Fundamentals of Human-Computer Interaction	6.0 hp	
2D1408	Evaluation Methods in Human-Computer Interaction	6.0 hp	
2D1410	User Centred Program Development	9.0 hp	
2D1413	Advanced Graphics and Interaction	9.0 hp	
2D1416	Computer Support for Cooperative Work	9.0 hp	
2D1418	Language Engineering	6.0 hp	
2D1420	Computer Vision, Basic Course	7.5 hp	
2D1424	Geometric Computing in Digital Image Analysis and Visualization	6.0 hp	
2D1426	Robotics and Autonomous Systems	7.5 hp	
2D1432	Artificial Neural Networks and Other Learning Systems	6.0 hp	
2D1435	Mathematical Modelling of Biological Systems	9.0 hp	
2D1440	Advanced Algorithms	6.0 hp	
2D1441	Seminars on Theoretical Computer Science	6.0 hp	
2D1446	Complexity Theory	6.0 hp	
2D1449	Foundations of Cryptography	6.0 hp	
2D1450	Algorithmic Bioinformatics	6.0 hp	
2D1464	Bigger Advanced, Individual Course in Computer Science	9.0 hp	
2D1465	Advanced, Individual Course in Computer Science	6.0 hp	
2D1469	Database Theory	6.0 hp	
2D1470	Object Oriented Database Systems	7.5 hp	
2D1482	Programming of Web Server Applications	6.0 hp	
2D1490	IP Routing in Simple Computer Networks	7.5 hp	
2D1491	IP Routing in Internet and Other Complex Networks	7.5 hp	
2D1518	Audio, Video and Multimedia Production	7.5 hp	
2D1520	Graphic Arts Technology, Minor Course	6.0 hp	
2D1953	Graphics and Interaction Programming	6.0 hp	
2E1252	Control Theory and Practice, Advanced Course	7.5 hp	
2E1262	Nonlinear Control	7.5 hp	
2E1340	Digital Signal Processing	7.5 hp	
2E1423	Signal Theory	7.5 hp	

2F1111	Speech Technology	6.0 hp	
2F1212	Music Acoustics	6.0 hp	
2F1213	Musical Communication and Music Technology	7.5 hp	
2F1300	Perception of Sound	7.5 hp	
2F1400	Electroacoustics	6.0 hp	
2F1410	Audio Technology	7.5 hp	
2G1113	Operating Systems	6.0 hp	
2G1117	Semantics for Programming Languages	6.0 hp	
2G1118	Network Programming with Java	6.0 hp	
2G1120	Computer Architecture Fundamentals, Intermediate Course	6.0 hp	
2G1121	Logic Programming	6.0 hp	
2G1126	Distributed Computer Systems	15.0 hp	
2G1301	Theory of Distributed Systems	6.0 hp	
2G1305	Internetworking	6.0 hp	
2G1316	Data Communications and Computer Networks	6.0 hp	
2G1318	Queuing Theory and Teletraffic Systems	6.0 hp	
2G1319	Communication System Design	15.0 hp	
2G1503	System Modelling and Simulation	9.0 hp	
2G1511	Computer Architecture	9.0 hp	
2G1915	Concurrent Programming	7.5 hp	
2I1130	Cognitive Psychology	6.0 hp	
2I1140	Artificial Intelligence	9.0 hp	
2I1150	Theory of Knowledge and Philosophy of Science	6.0 hp	
2I1224	Data Warehousing	6.0 hp	
2I1228	Enterprise Computing and ERP Systems	7.5 hp	
2I1229	Knowledge Management	6.0 hp	
2I1234	Machine Learning	6.0 hp	
2I1235	Agent Programming	6.0 hp	
2I1236	Intelligent Interfaces	6.0 hp	
2I1242	Models and Languages for Object and Web Databases	7.5 hp	
2I1251	Theory of Software Metrics	6.0 hp	
2I1255	Quality Models and Standards	6.0 hp	

2I1256	Current Problems in Software Engineering	6.0 hp	
2I1258	Large-Scale Software Engineering	7.5 hp	
2I1263	Internet Application Protocols and Standards	6.0 hp	
2I1264	Internet Programming I	6.0 hp	
2I1265	Internet Programming II	6.0 hp	
2I1266	Internet Programming III	6.0 hp	
2I1272	Security Architecture for Open Distributed Systems	6.0 hp	
2I1273	Principles of Computer Security	6.0 hp	
2I1274	Security Protocols and Applications in Computer Network	6.0 hp	
2I1276	Security for Java Environment and Electronic Commerce	6.0 hp	
2I1278	Computer Security - Overview	6.0 hp	
3C1355	Ecology, Advanced Course	6.0 hp	
3C1360	Environmental Consequences, Advanced Course	6.0 hp	
3C1395	Technology and Sustainable Development	6.0 hp	
5A1210	Thermodynamics	6.0 hp	
5A1414	Radiation Detectors and Medical Imaging Systems	7.5 hp	
5B1201	Complex Analysis	6.0 hp	
5B1202	Differential Equations and Transforms II	9.0 hp	
5B1303	Analysis, Basic Course	9.0 hp	
5B1305	Applied Combinatorics	6.0 hp	
5B1306	Financial Mathematics, Basic Course	7.5 hp	
5B1456	Seminar Course in Mathematics I	7.5 hp	
5B1457	Seminar Course in Mathematics II	7.5 hp	
5B1466	Fourier Analysis	7.5 hp	
5B1467	Algebra	7.5 hp	
5B1472	Functional Analysis	7.5 hp	
5B1479	Integration Theory	7.5 hp	
5B1750	Optimization	6.0 hp	
5C1212	Computational Fluid Dynamics	7.5 hp	
5C1213	Applied Computational Fluid Dynamics	3.0 hp	
7E1101	Medical Engineering, Basic Course	6.0 hp	
7E1110	Quality and Regulatory Aspects on Medical Devices	3.0 hp	



7E1112	Implants and Biomaterials	6.0 hp	
7E1113	Medical Instrumentation and Signal Processing	6.0 hp	
7E1114	Radiation Physics and Biology	6.0 hp	
7E1115	Engineering in Intensive Care and Anesthesia	6.0 hp	
7E1120	Biomedical Engineering, Basic Course	7.5 hp	
DA2190	General Cultural Knowledge	6.0 hp	Second cycle
DD2257	Visualization	7.5 hp	Second cycle
DD2371	Theory of Automata	6.0 hp	Second cycle
DD2380	Artificial Intelligence	6.0 hp	Second cycle
DD2381	Industrial Applications of Artificial Intelligence	6.0 hp	Second cycle
DD2387	Program System Construction Using C++	6.0 hp	Second cycle
DD2388	Program System Construction using .NET Framework	7.5 hp	Second cycle
DD2390	Internet Programming	6.0 hp	Second cycle
DD2392	Protocols and Principles of the Internet	7.5 hp	Second cycle
DD2395	Computer Security	6.0 hp	Second cycle
DD2422	Image Analysis and Computer Vision	6.0 hp	Second cycle
DD2426	Robotics and Autonomous Systems	7.5 hp	Second cycle
DD2427	Image Based Recognition and Classification	6.0 hp	Second cycle
DD2431	Machine Learning	6.0 hp	Second cycle
DD2432	Artificial Neural Networks and Other Learning Systems	6.0 hp	Second cycle
DD2433	Artificial Neural Networks, Advanced Course	6.0 hp	Second cycle
DD2435	Mathematical Modelling of Biological Systems	9.0 hp	Second cycle
DD2436	Modelling of Processes in Cell Biology	6.0 hp	Second cycle
DD2439	Artificial Intelligence and Multi-agent Systems, Project Course	21.0 hp	Second cycle
DD2440	Advanced Algorithms	6.0 hp	Second cycle
DD2441	Seminars on Theoretical Computer Science	6.0 hp	Second cycle
DD2446	Complexity Theory	6.0 hp	Second cycle
DD2447	Statistical Methods in Applied Computer Science	6.0 hp	Second cycle
DD2449	Foundations of Cryptography	6.0 hp	Second cycle
DD2450	Algorithmic Bioinformatics	6.0 hp	Second cycle
DD2452	Formal Methods	7.5 hp	Second cycle
DD2454	Semantics for Programming Languages	6.0 hp	Second cycle

DD2455	Theoretical Foundations of Object-Orientation	7.5 hp	Second cycle
DD2458	Problem Solving and Programming under Pressure	9.0 hp	Second cycle
DD2464	Bigger Advanced, Individual Course in Computer Science	9.0 hp	Second cycle
DD2465	Advanced, Individual Course in Computer Science	6.0 hp	Second cycle
DD2469	Database Theory	6.0 hp	Second cycle
DD2471	Modern Database Systems and Their Applications	7.5 hp	Second cycle
DD2472	Database Systems for Modern Applications	6.0 hp	Second cycle
DD2483	Development of Web Applications with Enterprise Java	6.0 hp	Second cycle
DD2486	Systems Programming and Operating Systems	7.5 hp	Second cycle
DD2488	Compiler Construction	9.0 hp	Second cycle
DD2490	IP Routing in Simple Computer Networks	7.5 hp	Second cycle
DD2491	IP Routing in Internet and Other Complex Networks	7.5 hp	Second cycle
DD2492	Net Design, Project Course	9.0 hp	Second cycle
DD2493	Seminars on Grid Computing and Internetworking	6.0 hp	Second cycle
DH1600	Communication in Engineering Sciences	7.5 hp	First cycle
DH2408	Evaluation Methods in Human-Computer Interaction	6.0 hp	Second cycle
DH2413	Advanced Graphics and Interaction	9.0 hp	Second cycle
DH2416	Computer Support for Cooperative Work	9.0 hp	Second cycle
DH2418	Language Engineering	6.0 hp	Second cycle
DH2603	Technologies that Change Time, Space and Reality	7.5 hp	Second cycle
DH2620	Human-Computer Interaction, Introductory Course	6.0 hp	Second cycle
DH2622	Human-Computer Interaction, Advanced Course with Prototyping	9.0 hp	Second cycle
DH2640	Graphics and Interaction Programming	9.0 hp	Second cycle
DH2650	Computer Game Design	6.0 hp	Second cycle
DH2655	Cooperative IT-design	9.0 hp	Second cycle
DM1523	Digital Video Production	7.5 hp	First cycle
DM1570	Graphic Arts Technology 1	7.0 hp	First cycle
DN2220	Applied Numerical Methods I	6.0 hp	Second cycle
DN2258	Introduction to High Performance Computing	7.5 hp	Second cycle
DN2266	Mathematical Models, Analysis and Simulation Part 1	7.5 hp	Second cycle
DT2212	Music Acoustics	7.5 hp	Second cycle
DT2213	Musical Communication and Music Technology	7.5 hp	Second cycle

<a href="#">EH2010</a>	Management of Technology	7.5 hp	Second cycle
<a href="#">EL1820</a>	Modelling of Dynamical Systems	6.0 hp	First cycle
<a href="#">EL2450</a>	Hybrid and Embedded Control Systems	7.5 hp	Second cycle
<a href="#">EL2520</a>	Control Theory and Practice, Advanced Course	7.5 hp	Second cycle
<a href="#">EL2620</a>	Nonlinear Control	7.5 hp	Second cycle
<a href="#">EN2100</a>	Sound Perception	7.5 hp	Second cycle
<a href="#">EP1100</a>	Data Communications and Computer Networks	7.5 hp	First cycle
<a href="#">EP2120</a>	Internetworking	7.5 hp	Second cycle
<a href="#">EP2200</a>	Queuing Theory and Teletraffic Systems	7.5 hp	Second cycle
<a href="#">EP2210</a>	Performance Analysis of Communication Networks	7.5 hp	Second cycle
<a href="#">EP2300</a>	Management of Networks and Networked Systems	7.5 hp	Second cycle
<a href="#">EQ1200</a>	Signal Theory	7.5 hp	First cycle
<a href="#">EQ2300</a>	Digital Signal Processing	7.5 hp	Second cycle
<a href="#">HL1000</a>	Quality and Regulatory Aspects on Medical Devices	3.0 hp	First cycle
<a href="#">HL2002</a>	Medical Instrumentation and Signal Processing	6.0 hp	Second cycle
<a href="#">HL2003</a>	Radiation Physics and Biology	6.0 hp	Second cycle
<a href="#">HL2004</a>	Engineering in Intensive Care and Anesthesia	6.0 hp	Second cycle
<a href="#">HL2005</a>	Implants and Biomaterials	6.0 hp	Second cycle
<a href="#">HL2006</a>	Medical Engineering, Basic Course	7.5 hp	Second cycle
<a href="#">IC1003</a>	Cognitive Science	6.0 hp	First cycle
<a href="#">IC1004</a>	Cognitive Psychology	6.0 hp	First cycle
<a href="#">IC1008</a>	Cognitive Science	7.5 hp	First cycle
<a href="#">ID1011</a>	Introduction to Software Engineering	7.5 hp	First cycle
<a href="#">ID1215</a>	Compilers and Execution Environments	7.5 hp	First cycle
<a href="#">ID1217</a>	Concurrent Programming	7.5 hp	First cycle
<a href="#">ID2000</a>	Machine Learning	6.0 hp	Second cycle
<a href="#">ID2008</a>	Software Engineering and Security Architecture	7.5 hp	Second cycle
<a href="#">ID2009</a>	Artificial Intelligence: Principles and Techniques	7.5 hp	Second cycle
<a href="#">ID2012</a>	Ubiquitous Computing	7.5 hp	Second cycle
<a href="#">ID2013</a>	Internet Programming I	7.5 hp	Second cycle
<a href="#">ID2014</a>	Internet Programming II	7.5 hp	Second cycle
<a href="#">ID2015</a>	Internet Programming III	7.5 hp	Second cycle

ID2201	Distributed Systems, Basic Course	7.5 hp	Second cycle
ID2203	Distributed Systems, Advanced Course	7.5 hp	Second cycle
ID2206	Operating Systems	7.5 hp	Second cycle
ID2207	Modern Methods in Software Engineering	7.5 hp	Second cycle
ID2208	Programming Web-Services	7.5 hp	Second cycle
ID2209	Distributed Artificial Intelligence and Intelligent Agents	7.5 hp	Second cycle
ID2212	Network Programming with Java	7.5 hp	Second cycle
ID2213	Logic Programming	7.5 hp	Second cycle
ID2216	Developing Mobile Applications	7.5 hp	Second cycle
IK1550	Internetworking	6.0 hp	First cycle
IK2206	Internet Security and Privacy	7.5 hp	Second cycle
IK2207	Communication System Design	18.0 hp	Second cycle
IK2208	Communication System Design	24.0 hp	Second cycle
IK2209	Communication System Design	30.0 hp	Second cycle
IK2210	GSM Network and Services	7.5 hp	Second cycle
IK2213	Network Services and Internet-based Applications	7.5 hp	Second cycle
IK2554	Practical Voice Over IP (VoIP)	7.5 hp	Second cycle
IK2555	Wireless and Mobile Network Architectures	7.5 hp	Second cycle
IS1202	Computer Systems Architecture	7.5 hp	First cycle
IS2206	Research Methods in Computer Systems Engineering	7.5 hp	Second cycle
IV1200	System Modelling and Simulation	7.5 hp	First cycle
IV2000	Security Management	7.5 hp	Second cycle
IV2001	Internet and ERP Systems	7.5 hp	Second cycle
IV2002	Internet Search and Monitoring Techniques	7.5 hp	Second cycle
IV2007	Enterprise Computing and ERP Systems	7.5 hp	Second cycle
IV2008	Models and Languages for Object and Web Databases	7.5 hp	Second cycle
IV2009	Model-driven Development of Components	7.5 hp	Second cycle
IV2010	Mobile Business	7.5 hp	Second cycle
IV2016	Project and Power Games	7.5 hp	Second cycle
IV2020	Network Security	7.5 hp	Second cycle
IV2021	Legal Aspects of Information Security	7.5 hp	Second cycle
IV2022	Security Management	15.0 hp	Second cycle

IV2023	Value Based Risk Management	7.5 hp	Second cycle
LI1021	Information Searching	1.5 hp	First cycle
MJ2611	Introduction Industrial Ecology	6.0 hp	Second cycle
MJ2651	Ecology, Advanced Course	6.0 hp	Second cycle
MJ2691	Technology and Sustainable Development	6.0 hp	Second cycle
SF2700	Analysis, Basic Course	9.0 hp	Second cycle
SF2701	Financial Mathematics, Basic Course	7.5 hp	Second cycle
SF2702	Wavelets	6.0 hp	Second cycle
SF2703	Algebra, Basic Course	6.0 hp	Second cycle
SH2310	Radiation Detectors and Medical Imaging Systems	7.5 hp	Second cycle

## Year 5

### Conditionally elective courses

Code	Name	Credits	Edu. level
2D1020	Master's Project in Numerical Analysis	30.0 hp	Second cycle
2D1021	Master's Project in Computer Science	30.0 hp	Second cycle
2D1024	Master's Project in Human - Computer Interaction	30.0 hp	Second cycle
2D1025	Master's Project in Biomedical Engineering	30.0 hp	Second cycle
2F1017	Master's Project in Music Acoustics	30.0 hp	Second cycle
2F1018	Master's Project in Speech Communication	30.0 hp	Second cycle
2I1020	Master's Project in Computer and Systems Sciences	30.0 hp	Second cycle
DD221X	Degree Project in Computer Science, Second Cycle	30.0 hp	Second cycle
DD225X	Degree Project in Biomedical Engineering, Second Cycle	30.0 hp	Second cycle
DH224X	Degree Project in Human-Computer Interaction, Second Cycle	30.0 hp	Second cycle
DN220X	Degree Project in Numerical Analysis, Second Cycle	30.0 hp	Second cycle
DT217X	Degree Project in Music Acoustics, Second Cycle	30.0 hp	Second cycle
DT218X	Degree Project in Speech Communication, Second Cycle	30.0 hp	Second cycle

# Autonomous Systems (AUTO)

Year 3

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1420</a>	Computer Vision, Basic Course	7.5 hp	
<a href="#">2D1424</a>	Geometric Computing in Digital Image Analysis and Visualization	6.0 hp	
<a href="#">2E1350</a>	Adaptive Signal Processing	6.0 hp	
<a href="#">2E1423</a>	Signal Theory	7.5 hp	
<a href="#">2I1140</a>	Artificial Intelligence	9.0 hp	
<a href="#">5B1750</a>	Optimization	6.0 hp	

Year 4

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1220</a>	Applied Numerical Methods I	6.0 hp	
<a href="#">2D1365</a>	Overview of Human-computer Interaction	6.0 hp	
<a href="#">2D1381</a>	Industrial Applications of Artificial Intelligence	6.0 hp	
<a href="#">2D1426</a>	Robotics and Autonomous Systems	7.5 hp	
<a href="#">2D1431</a>	Machine Learning	6.0 hp	
<a href="#">2D1432</a>	Artificial Neural Networks and Other Learning Systems	6.0 hp	
<a href="#">2D1435</a>	Mathematical Modelling of Biological Systems	9.0 hp	
<a href="#">2E1200</a>	Automatic Control, General Course	6.0 hp	
<a href="#">2E1252</a>	Control Theory and Practice, Advanced Course	7.5 hp	
<a href="#">2E1262</a>	Nonlinear Control	7.5 hp	
<a href="#">2E1340</a>	Digital Signal Processing	7.5 hp	
<a href="#">2G1915</a>	Concurrent Programming	7.5 hp	
<a href="#">2I1130</a>	Cognitive Psychology	6.0 hp	
<a href="#">7E1101</a>	Medical Engineering, Basic Course	6.0 hp	
<a href="#">DD2381</a>	Industrial Applications of Artificial Intelligence	6.0 hp	Second cycle
<a href="#">DD2387</a>	Program System Construction Using C++	6.0 hp	Second cycle
<a href="#">DD2439</a>	Artificial Intelligence and Multi-agent Systems, Project Course	21.0 hp	Second cycle
<a href="#">DH2620</a>	Human-Computer Interaction, Introductory Course	6.0 hp	Second cycle
<a href="#">DN2220</a>	Applied Numerical Methods I	6.0 hp	Second cycle
<a href="#">EL1110</a>	Automatic Control, General Course	6.0 hp	First cycle
<a href="#">EN2200</a>	Pattern Recognition	6.0 hp	Second cycle
<a href="#">EQ1200</a>	Signal Theory	7.5 hp	First cycle
<a href="#">IC1004</a>	Cognitive Psychology	6.0 hp	First cycle
<a href="#">ID1217</a>	Concurrent Programming	7.5 hp	First cycle
<a href="#">ID2204</a>	Constraint Programming	7.5 hp	Second cycle
<a href="#">ID2209</a>	Distributed Artificial Intelligence and Intelligent Agents	7.5 hp	Second cycle
<a href="#">ID2213</a>	Logic Programming	7.5 hp	Second cycle
<a href="#">SF1851</a>	Optimization	6.0 hp	First cycle



## Recommended courses

Code	Name	Credits	Edu. level
<a href="#">DD2380</a>	Artificial Intelligence	6.0 hp	Second cycle
<a href="#">DD2422</a>	Image Analysis and Computer Vision	6.0 hp	Second cycle
<a href="#">DD2426</a>	Robotics and Autonomous Systems	7.5 hp	Second cycle
<a href="#">DD2427</a>	Image Based Recognition and Classification	6.0 hp	Second cycle
<a href="#">DD2428</a>	Geometric Computing and Visualization	6.0 hp	Second cycle
<a href="#">DD2431</a>	Machine Learning	6.0 hp	Second cycle
<a href="#">DD2432</a>	Artificial Neural Networks and Other Learning Systems	6.0 hp	Second cycle
<a href="#">DD2433</a>	Artificial Neural Networks, Advanced Course	6.0 hp	Second cycle

## Scientific Computing (BERT)

Year 4

### Mandatory courses (6.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">DN2264</a>	Parallel Computations for Large-Scale Problems, Part 1	6.0 hp	Second cycle

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">DD2257</a>	Visualization	7.5 hp	Second cycle
<a href="#">DN2253</a>	Numerical Algebra, Methods for Large Matrices	7.5 hp	Second cycle
<a href="#">DN2255</a>	Numerical Solutions of Differential Equations	7.5 hp	Second cycle
<a href="#">DN2258</a>	Introduction to High Performance Computing	7.5 hp	Second cycle
<a href="#">DN2260</a>	The Finite Element Method	6.0 hp	Second cycle
<a href="#">DN2265</a>	Parallel Computations for Large-Scale Problems, Part 2	3.0 hp	Second cycle
<a href="#">DN2269</a>	Mathematical Models, Analysis and Simulation, part 2	7.5 hp	Second cycle
<a href="#">DN2290</a>	Advanced Numerical Analysis	7.5 hp	Second cycle

# Biomedical Engineering (BIO)

## Year 3

### Mandatory courses (22.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">7E1200</a>	Cellular and Molecular Biology	15.0 hp	
<a href="#">7E1201</a>	Neuroscience	7.5 hp	

## Year 4

### Mandatory courses (7.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">7E1202</a>	Systems Biology	7.5 hp	

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1266</a>	Mathematical Models, Analysis and Simulation Part 1	7.5 hp	
<a href="#">2D1420</a>	Computer Vision, Basic Course	7.5 hp	
<a href="#">2D1432</a>	Artificial Neural Networks and Other Learning Systems	6.0 hp	
<a href="#">2D1435</a>	Mathematical Modelling of Biological Systems	9.0 hp	
<a href="#">2D1450</a>	Algorithmic Bioinformatics	6.0 hp	
<a href="#">2F1510</a>	Pattern Recognition	6.0 hp	
<a href="#">5A1352</a>	Complex Systems	6.0 hp	

# Biomedical Engineering (BMT)

Year 4

## Mandatory courses (7.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">HL1010</a>	Systems Biology	7.5 hp	First cycle

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">DD2422</a>	Image Analysis and Computer Vision	6.0 hp	Second cycle
<a href="#">DD2431</a>	Machine Learning	6.0 hp	Second cycle
<a href="#">DD2432</a>	Artificial Neural Networks and Other Learning Systems	6.0 hp	Second cycle
<a href="#">DD2433</a>	Artificial Neural Networks, Advanced Course	6.0 hp	Second cycle
<a href="#">DD2435</a>	Mathematical Modelling of Biological Systems	9.0 hp	Second cycle
<a href="#">DD2436</a>	Modelling of Processes in Cell Biology	6.0 hp	Second cycle
<a href="#">DD2447</a>	Statistical Methods in Applied Computer Science	6.0 hp	Second cycle
<a href="#">DD2450</a>	Algorithmic Bioinformatics	6.0 hp	Second cycle
<a href="#">DN2266</a>	Mathematical Models, Analysis and Simulation Part 1	7.5 hp	Second cycle
<a href="#">EN2100</a>	Sound Perception	7.5 hp	Second cycle
<a href="#">EN2200</a>	Pattern Recognition	6.0 hp	Second cycle
<a href="#">HL2006</a>	Medical Engineering, Basic Course	7.5 hp	Second cycle

# Computer Security (DATA)

## Year 3

### Mandatory courses (18.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2I1272</a>	Security Architecture for Open Distributed Systems	6.0 hp	
<a href="#">2I1273</a>	Principles of Computer Security	6.0 hp	
<a href="#">2I1274</a>	Security Protocols and Applications in Computer Network	6.0 hp	

### Recommended courses

Code	Name	Credits	Edu. level
<a href="#">2I1263</a>	Internet Application Protocols and Standards	6.0 hp	

## Year 4

### Mandatory courses (12.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">DD2395</a>	Computer Security	6.0 hp	Second cycle
<a href="#">DD2495</a>	Network Security	6.0 hp	Second cycle

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">2F1111</a>	Speech Technology	6.0 hp	
<a href="#">DD2387</a>	Program System Construction Using C++	6.0 hp	Second cycle
<a href="#">DD2440</a>	Advanced Algorithms	6.0 hp	Second cycle
<a href="#">DD2441</a>	Seminars on Theoretical Computer Science	6.0 hp	Second cycle
<a href="#">DD2449</a>	Foundations of Cryptography	6.0 hp	Second cycle
<a href="#">DD2452</a>	Formal Methods	7.5 hp	Second cycle
<a href="#">DD2453</a>	Advanced Formal Methods	7.5 hp	Second cycle
<a href="#">DD2454</a>	Semantics for Programming Languages	6.0 hp	Second cycle
<a href="#">DD2458</a>	Problem Solving and Programming under Pressure	9.0 hp	Second cycle
<a href="#">DD2486</a>	Systems Programming and Operating Systems	7.5 hp	Second cycle
<a href="#">DD2490</a>	IP Routing in Simple Computer Networks	7.5 hp	Second cycle
<a href="#">DD2491</a>	IP Routing in Internet and Other Complex Networks	7.5 hp	Second cycle
<a href="#">ID2002</a>	Value-Based Software Engineering	7.5 hp	Second cycle
<a href="#">IV2021</a>	Legal Aspects of Information Security	7.5 hp	Second cycle

## Recommended courses

Code	Name	Credits	Edu. level
<a href="#">2D1392</a>	Protocols and Principles of the Internet	7.5 hp	
<a href="#">2D1440</a>	Advanced Algorithms	6.0 hp	
<a href="#">2G1301</a>	Theory of Distributed Systems	6.0 hp	
<a href="#">2I1276</a>	Security for Java Environment and Electronic Commerce	6.0 hp	

# Distributed Systems (DIST)

Year 4

## Mandatory courses (15.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">ID2201</a>	Distributed Systems, Basic Course	7.5 hp	Second cycle
<a href="#">ID2203</a>	Distributed Systems, Advanced Course	7.5 hp	Second cycle

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">ID1217</a>	Concurrent Programming	7.5 hp	First cycle
<a href="#">ID2204</a>	Constraint Programming	7.5 hp	Second cycle
<a href="#">ID2207</a>	Modern Methods in Software Engineering	7.5 hp	Second cycle
<a href="#">ID2208</a>	Programming Web-Services	7.5 hp	Second cycle
<a href="#">ID2209</a>	Distributed Artificial Intelligence and Intelligent Agents	7.5 hp	Second cycle
<a href="#">ID2210</a>	Distributed Computing, Peer-to-Peer and GRIDS	7.5 hp	Second cycle
<a href="#">ID2212</a>	Network Programming with Java	7.5 hp	Second cycle
<a href="#">IK2206</a>	Internet Security and Privacy	7.5 hp	Second cycle
<a href="#">IV1200</a>	System Modelling and Simulation	7.5 hp	First cycle

# Computer Systems (DSYS)

## Year 3

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1373</a>	Artificial Languages and Syntax Analysis	6.0 hp	
<a href="#">2D1426</a>	Robotics and Autonomous Systems	7.5 hp	
<a href="#">2G1113</a>	Operating Systems	6.0 hp	
<a href="#">2G1316</a>	Data Communications and Computer Networks	6.0 hp	
<a href="#">2G1503</a>	System Modelling and Simulation	9.0 hp	

## Year 4

### Mandatory courses (30.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2G1120</a>	Computer Architecture Fundamentals, Intermediate Course	6.0 hp	
<a href="#">2G1126</a>	Distributed Computer Systems	15.0 hp	
<a href="#">2G1511</a>	Computer Architecture	9.0 hp	

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">2B1511</a>	Modern Digital Construction with VHDL	7.5 hp	
<a href="#">2D1258</a>	Introduction to High Performance Computing	7.5 hp	
<a href="#">2D1263</a>	Program Construction for Scientific Computing	6.0 hp	
<a href="#">2D1375</a>	Implementation of Programming Languages	6.0 hp	
<a href="#">2D1432</a>	Artificial Neural Networks and Other Learning Systems	6.0 hp	
<a href="#">2G1114</a>	Parallel Computer Systems	7.5 hp	
<a href="#">2G1117</a>	Semantics for Programming Languages	6.0 hp	
<a href="#">2G1118</a>	Network Programming with Java	6.0 hp	
<a href="#">2G1121</a>	Logic Programming	6.0 hp	
<a href="#">2G1301</a>	Theory of Distributed Systems	6.0 hp	
<a href="#">2G1318</a>	Queuing Theory and Teletraffic Systems	6.0 hp	
<a href="#">2G1915</a>	Concurrent Programming	7.5 hp	



# Computer Systems Engineering (DTEK)

Year 4

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">DD2488</a>	Compiler Construction	9.0 hp	Second cycle
<a href="#">DN2258</a>	Introduction to High Performance Computing	7.5 hp	Second cycle
<a href="#">DN2264</a>	Parallel Computations for Large-Scale Problems, Part 1	6.0 hp	Second cycle
<a href="#">ID1215</a>	Compilers and Execution Environments	7.5 hp	First cycle
<a href="#">IL2200</a>	ASIC-design Methodology with High-level Languages	7.5 hp	Second cycle
<a href="#">IL2204</a>	DSP-Construction with HDL	7.5 hp	Second cycle
<a href="#">IL2206</a>	Embedded Systems	7.5 hp	Second cycle
<a href="#">IL2207</a>	System-On-Chip Architectures	7.5 hp	Second cycle
<a href="#">IL2212</a>	Embedded Software	7.5 hp	Second cycle
<a href="#">IL2217</a>	Digital Design with HDL	7.5 hp	Second cycle
<a href="#">IS1202</a>	Computer Systems Architecture	7.5 hp	First cycle
<a href="#">IS2206</a>	Research Methods in Computer Systems Engineering	7.5 hp	Second cycle
<a href="#">IV1200</a>	System Modelling and Simulation	7.5 hp	First cycle

# Industrial Information and Control Systems (IIS)

Year 4

## Mandatory courses (37.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">2C1228</a>	Industrial Information Systems, Systems Engineering	7.5 hp	
<a href="#">EH2010</a>	Management of Technology	7.5 hp	Second cycle
<a href="#">EH2020</a>	Industrial Control and Information Systems	7.5 hp	Second cycle
<a href="#">EH2040</a>	Industrial Information Systems, Systems Engineering	7.5 hp	Second cycle
<a href="#">EH2050</a>	Industrial Information Systems, Case Studies	7.5 hp	Second cycle

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">AK2014</a>	Decision Theory	7.5 hp	Second cycle
<a href="#">DD2395</a>	Computer Security	6.0 hp	Second cycle
<a href="#">DD2471</a>	Modern Database Systems and Their Applications	7.5 hp	Second cycle
<a href="#">DH2620</a>	Human-Computer Interaction, Introductory Course	6.0 hp	Second cycle
<a href="#">EH2030</a>	Business Development and Quality Management	7.5 hp	Second cycle
<a href="#">EH2730</a>	Requirements Engineering	7.5 hp	Second cycle
<a href="#">ID2003</a>	Software Testing and Metrics	7.5 hp	Second cycle
<a href="#">IV2007</a>	Enterprise Computing and ERP Systems	7.5 hp	Second cycle
<a href="#">IV2031</a>	Strategic Management of IT	7.5 hp	Second cycle
<a href="#">ME1004</a>	Industrial Management, Basic Course	6.0 hp	First cycle
<a href="#">ME2037</a>	Project Communication	6.0 hp	Second cycle
<a href="#">ME2038</a>	IT Management	6.0 hp	Second cycle
<a href="#">ME2042</a>	Business Negotiations	6.0 hp	Second cycle

# Information Systems and Databases (INFO)

Year 3

## Mandatory courses (19.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">2I1224</a>	Data Warehousing	6.0 hp	
<a href="#">2I1228</a>	Enterprise Computing and ERP Systems	7.5 hp	
<a href="#">2I1229</a>	Knowledge Management	6.0 hp	

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">2I1140</a>	Artificial Intelligence	9.0 hp	
<a href="#">2I1236</a>	Intelligent Interfaces	6.0 hp	
<a href="#">2I1251</a>	Theory of Software Metrics	6.0 hp	
<a href="#">2I1258</a>	Large-Scale Software Engineering	7.5 hp	
<a href="#">2I1263</a>	Internet Application Protocols and Standards	6.0 hp	
<a href="#">2I1272</a>	Security Architecture for Open Distributed Systems	6.0 hp	
<a href="#">2I1273</a>	Principles of Computer Security	6.0 hp	
<a href="#">2I1274</a>	Security Protocols and Applications in Computer Network	6.0 hp	

## Year 4

### Mandatory courses (52.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">2I1242</a>	Models and Languages for Object and Web Databases	7.5 hp	
<a href="#">IV2001</a>	Internet and ERP Systems	7.5 hp	Second cycle
<a href="#">IV2007</a>	Enterprise Computing and ERP Systems	7.5 hp	Second cycle
<a href="#">IV2008</a>	Models and Languages for Object and Web Databases	7.5 hp	Second cycle
<a href="#">IV2012</a>	Knowledge and Software Reuse	7.5 hp	Second cycle
<a href="#">IV2014</a>	Data Warehousing	7.5 hp	Second cycle
<a href="#">IV2015</a>	Knowledge Management	7.5 hp	Second cycle

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2I1256</a>	Current Problems in Software Engineering	6.0 hp	
<a href="#">2I1264</a>	Internet Programming I	6.0 hp	
<a href="#">2I1265</a>	Internet Programming II	6.0 hp	
<a href="#">2I1266</a>	Internet Programming III	6.0 hp	
<a href="#">2I1276</a>	Security for Java Environment and Electronic Commerce	6.0 hp	
<a href="#">2I1278</a>	Computer Security - Overview	6.0 hp	

## Recommended courses

Code	Name	Credits	Edu. level
<a href="#">ID2006</a>	Software Evolution and Maintenance	7.5 hp	Second cycle
<a href="#">ID2007</a>	Processes for IT Production	7.5 hp	Second cycle
<a href="#">IV2002</a>	Internet Search and Monitoring Techniques	7.5 hp	Second cycle
<a href="#">IV2009</a>	Model-driven Development of Components	7.5 hp	Second cycle
<a href="#">IV2013</a>	Relational Database Design	7.5 hp	Second cycle
<a href="#">IV2016</a>	Project and Power Games	7.5 hp	Second cycle
<a href="#">IV2017</a>	Interoperability of Enterprise Systems and Services	7.5 hp	Second cycle
<a href="#">IV2029</a>	Global IT-management	7.5 hp	Second cycle
<a href="#">IV2030</a>	Management of IT-enabled Change	7.5 hp	Second cycle
<a href="#">IV2031</a>	Strategic Management of IT	7.5 hp	Second cycle

## Intelligent Interactive Systems (INTE)

### Year 3

### Mandatory courses (27.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2I1140</a>	Artificial Intelligence	9.0 hp	
<a href="#">2I1234</a>	Machine Learning	6.0 hp	
<a href="#">2I1235</a>	Agent Programming	6.0 hp	
<a href="#">2I1236</a>	Intelligent Interfaces	6.0 hp	

## Recommended courses

Code	Name	Credits	Edu. level
<a href="#">2D1432</a>	Artificial Neural Networks and Other Learning Systems	6.0 hp	
<a href="#">2I1263</a>	Internet Application Protocols and Standards	6.0 hp	

## Year 4

### Mandatory courses (43.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">IC1003</a>	Cognitive Science	6.0 hp	First cycle
<a href="#">IC1008</a>	Cognitive Science	7.5 hp	First cycle
<a href="#">ID2009</a>	Artificial Intelligence: Principles and Techniques	7.5 hp	Second cycle
<a href="#">ID2010</a>	Programming of Interactive Systems	7.5 hp	Second cycle
<a href="#">ID2011</a>	Microsimulation	7.5 hp	Second cycle
<a href="#">ID2012</a>	Ubiquitous Computing	7.5 hp	Second cycle

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">ID1008</a>	Internet Application Protocols and Standards	6.0 hp	First cycle

## Recommended courses

Code	Name	Credits	Edu. level
<a href="#">2D1365</a>	Overview of Human-computer Interaction	6.0 hp	
<a href="#">2I1130</a>	Cognitive Psychology	6.0 hp	
<a href="#">2I1150</a>	Theory of Knowledge and Philosophy of Science	6.0 hp	
<a href="#">2I1264</a>	Internet Programming I	6.0 hp	
<a href="#">2I1265</a>	Internet Programming II	6.0 hp	
<a href="#">IC1002</a>	Web-design	7.5 hp	First cycle
<a href="#">IC1004</a>	Cognitive Psychology	6.0 hp	First cycle
<a href="#">IC2000</a>	Methods for the Design of Multimedia and Interactive Systems	9.0 hp	Second cycle
<a href="#">IC2001</a>	Complex Social Networks	6.0 hp	Second cycle
<a href="#">IC2007</a>	Collaborative Computing	7.5 hp	Second cycle
<a href="#">IC2008</a>	Affective Interaction	7.5 hp	Second cycle
<a href="#">IC2010</a>	Advanced Individual Course in Human-Computer Interaction	7.5 hp	Second cycle
<a href="#">ID2013</a>	Internet Programming I	7.5 hp	Second cycle
<a href="#">ID2014</a>	Internet Programming II	7.5 hp	Second cycle
<a href="#">ID2209</a>	Distributed Artificial Intelligence and Intelligent Agents	7.5 hp	Second cycle

## IT Project Management and Organisation (IPOD)

Year 4

### Mandatory courses (18.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">ME2015</a>	Project Management: Leadership and Control	6.0 hp	Second cycle
<a href="#">ME2017</a>	Project Management: Leading Project-based Operations	6.0 hp	Second cycle
<a href="#">ME2032</a>	Economics of Industrial and Technical Transformation	6.0 hp	Second cycle

## Conditionally elective courses

Code	Name	Credits	Edu. level
<a href="#">ME2018</a>	Leading Temporary Organizations and Projects	6.0 hp	Second cycle
<a href="#">ME2039</a>	Knowledge Management	6.0 hp	Second cycle

## Internet Working Technology (ITEK)

Year 4

### Mandatory courses (15.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">DD2392</a>	Protocols and Principles of the Internet	7.5 hp	Second cycle
<a href="#">DD2490</a>	IP Routing in Simple Computer Networks	7.5 hp	Second cycle

### Recommended courses

Code	Name	Credits	Edu. level
<a href="#">DD2390</a>	Internet Programming	6.0 hp	Second cycle
<a href="#">DD2395</a>	Computer Security	6.0 hp	Second cycle
<a href="#">DD2491</a>	IP Routing in Internet and Other Complex Networks	7.5 hp	Second cycle
<a href="#">DD2492</a>	Net Design, Project Course	9.0 hp	Second cycle
<a href="#">EP2200</a>	Queuing Theory and Teletraffic Systems	7.5 hp	Second cycle
<a href="#">EP2210</a>	Performance Analysis of Communication Networks	7.5 hp	Second cycle
<a href="#">EP2300</a>	Management of Networks and Networked Systems	7.5 hp	Second cycle
<a href="#">ID2206</a>	Operating Systems	7.5 hp	Second cycle
<a href="#">ID2210</a>	Distributed Computing, Peer-to-Peer and GRIDS	7.5 hp	Second cycle
<a href="#">IK2213</a>	Network Services and Internet-based Applications	7.5 hp	Second cycle
<a href="#">IK2554</a>	Practical Voice Over IP (VoIP)	7.5 hp	Second cycle
<a href="#">IK2555</a>	Wireless and Mobile Network Architectures	7.5 hp	Second cycle



# Communication Systems (KSYS)

## Year 3

### Mandatory courses (18.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2G1113</a>	Operating Systems	6.0 hp	
<a href="#">2G1305</a>	Internetworking	6.0 hp	
<a href="#">2G1316</a>	Data Communications and Computer Networks	6.0 hp	

## Year 4

### Mandatory courses (166.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">2G1319</a>	Communication System Design	15.0 hp	
<a href="#">2G1711</a>	Communication System Design	18.0 hp	
<a href="#">2G1712</a>	Communication System Design	24.0 hp	
<a href="#">2G1713</a>	Communication System Design	30.0 hp	
<a href="#">EP2120</a>	Internetworking	7.5 hp	Second cycle
<a href="#">IK2207</a>	Communication System Design	18.0 hp	Second cycle
<a href="#">IK2208</a>	Communication System Design	24.0 hp	Second cycle
<a href="#">IK2209</a>	Communication System Design	30.0 hp	Second cycle

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">2G1120</a>	Computer Architecture Fundamentals, Intermediate Course	6.0 hp	
<a href="#">2G1301</a>	Theory of Distributed Systems	6.0 hp	
<a href="#">2G1318</a>	Queuing Theory and Teletraffic Systems	6.0 hp	
<a href="#">2G1330</a>	Wireless and Mobile Network Architectures	7.5 hp	
<a href="#">2G1331</a>	Management of Network and Networked Systems	6.0 hp	
<a href="#">2G1915</a>	Concurrent Programming	7.5 hp	

## Recommended courses

Code	Name	Credits	Edu. level
<a href="#">DD2452</a>	Formal Methods	7.5 hp	Second cycle
<a href="#">EP2200</a>	Queuing Theory and Teletraffic Systems	7.5 hp	Second cycle
<a href="#">EP2210</a>	Performance Analysis of Communication Networks	7.5 hp	Second cycle
<a href="#">EP2300</a>	Management of Networks and Networked Systems	7.5 hp	Second cycle
<a href="#">ID1217</a>	Concurrent Programming	7.5 hp	First cycle
<a href="#">ID2216</a>	Developing Mobile Applications	7.5 hp	Second cycle
<a href="#">IK2206</a>	Internet Security and Privacy	7.5 hp	Second cycle
<a href="#">IK2210</a>	GSM Network and Services	7.5 hp	Second cycle
<a href="#">IK2213</a>	Network Services and Internet-based Applications	7.5 hp	Second cycle
<a href="#">IK2554</a>	Practical Voice Over IP (VoIP)	7.5 hp	Second cycle
<a href="#">IK2555</a>	Wireless and Mobile Network Architectures	7.5 hp	Second cycle
<a href="#">IS1202</a>	Computer Systems Architecture	7.5 hp	First cycle

# Human-Computer Interaction (MDAT)

## Year 3

### Mandatory courses (6.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2D1953</a>	Graphics and Interaction Programming	6.0 hp	

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">4K1401</a>	History of Technology, a General Survey	6.0 hp	

## Year 4

### Mandatory courses (51.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">2D1406</a>	Fundamentals of Human-Computer Interaction	6.0 hp	
<a href="#">2D1408</a>	Evaluation Methods in Human-Computer Interaction	6.0 hp	
<a href="#">2D1410</a>	User Centred Program Development	9.0 hp	
<a href="#">2D1416</a>	Computer Support for Cooperative Work	9.0 hp	
<a href="#">2I1130</a>	Cognitive Psychology	6.0 hp	
<a href="#">DH2620</a>	Human-Computer Interaction, Introductory Course	6.0 hp	Second cycle
<a href="#">DH2622</a>	Human-Computer Interaction, Advanced Course with Prototyping	9.0 hp	Second cycle

## Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1378</a>	Text and Image Processing	6.0 hp	
<a href="#">2D1381</a>	Industrial Applications of Artificial Intelligence	6.0 hp	
<a href="#">2D1413</a>	Advanced Graphics and Interaction	9.0 hp	
<a href="#">2D1418</a>	Language Engineering	6.0 hp	
<a href="#">2D1420</a>	Computer Vision, Basic Course	7.5 hp	
<a href="#">2D1518</a>	Audio, Video and Multimedia Production	7.5 hp	
<a href="#">2I1150</a>	Theory of Knowledge and Philosophy of Science	6.0 hp	

## Recommended courses

Code	Name	Credits	Edu. level
<a href="#">DD2381</a>	Industrial Applications of Artificial Intelligence	6.0 hp	Second cycle
<a href="#">DD2422</a>	Image Analysis and Computer Vision	6.0 hp	Second cycle
<a href="#">DH1378</a>	Text and Image Processing	6.0 hp	First cycle
<a href="#">DH2400</a>	Physical Interaction Design and Realization	7.5 hp	Second cycle
<a href="#">DH2408</a>	Evaluation Methods in Human-Computer Interaction	6.0 hp	Second cycle
<a href="#">DH2413</a>	Advanced Graphics and Interaction	9.0 hp	Second cycle
<a href="#">DH2416</a>	Computer Support for Cooperative Work	9.0 hp	Second cycle
<a href="#">DH2418</a>	Language Engineering	6.0 hp	Second cycle
<a href="#">DH2603</a>	Technologies that Change Time, Space and Reality	7.5 hp	Second cycle
<a href="#">DH2630</a>	Methods in Behavioural Science	6.0 hp	Second cycle
<a href="#">DH2650</a>	Computer Game Design	6.0 hp	Second cycle
<a href="#">DH2651</a>	Computer Game Design and Advanced Graphics	9.0 hp	Second cycle
<a href="#">DH2655</a>	Cooperative IT-design	9.0 hp	Second cycle
<a href="#">DT2213</a>	Musical Communication and Music Technology	7.5 hp	Second cycle
<a href="#">EN2200</a>	Pattern Recognition	6.0 hp	Second cycle
<a href="#">IC1004</a>	Cognitive Psychology	6.0 hp	First cycle
<a href="#">ME2041</a>	Psychology for Engineers	6.0 hp	Second cycle

# Program System Technology (PSYS)

## Year 3

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1370</a>	Functional Programming	6.0 hp	
<a href="#">2D1373</a>	Artificial Languages and Syntax Analysis	6.0 hp	
<a href="#">2D1450</a>	Algorithmic Bioinformatics	6.0 hp	
<a href="#">2D1470</a>	Object Oriented Database Systems	7.5 hp	
<a href="#">2D1482</a>	Programming of Web Server Applications	6.0 hp	
<a href="#">2G1113</a>	Operating Systems	6.0 hp	
<a href="#">2I1140</a>	Artificial Intelligence	9.0 hp	
<a href="#">5B1305</a>	Applied Combinatorics	6.0 hp	

## Year 4

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1375</a>	Implementation of Programming Languages	6.0 hp	
<a href="#">2D1381</a>	Industrial Applications of Artificial Intelligence	6.0 hp	
<a href="#">2D1387</a>	Program System Construction Using C++	6.0 hp	
<a href="#">2D1390</a>	Internet Programming	6.0 hp	
<a href="#">2D1392</a>	Protocols and Principles of the Internet	7.5 hp	
<a href="#">2D1418</a>	Language Engineering	6.0 hp	
<a href="#">2D1431</a>	Machine Learning	6.0 hp	
<a href="#">2D1440</a>	Advanced Algorithms	6.0 hp	
<a href="#">2D1469</a>	Database Theory	6.0 hp	
<a href="#">2D1490</a>	IP Routing in Simple Computer Networks	7.5 hp	
<a href="#">2D1491</a>	IP Routing in Internet and Other Complex Networks	7.5 hp	

2G1117	Semantics for Programming Languages	6.0 hp	
2G1301	Theory of Distributed Systems	6.0 hp	
2G1915	Concurrent Programming	7.5 hp	
DD2371	Theory of Automata	6.0 hp	Second cycle
DD2380	Artificial Intelligence	6.0 hp	Second cycle
DD2381	Industrial Applications of Artificial Intelligence	6.0 hp	Second cycle
DD2387	Program System Construction Using C++	6.0 hp	Second cycle
DD2388	Program System Construction using .NET Framework	7.5 hp	Second cycle
DD2390	Internet Programming	6.0 hp	Second cycle
DD2395	Computer Security	6.0 hp	Second cycle
DD2431	Machine Learning	6.0 hp	Second cycle
DD2440	Advanced Algorithms	6.0 hp	Second cycle
DD2450	Algorithmic Bioinformatics	6.0 hp	Second cycle
DD2452	Formal Methods	7.5 hp	Second cycle
DD2454	Semantics for Programming Languages	6.0 hp	Second cycle
DD2455	Theoretical Foundations of Object-Orientation	7.5 hp	Second cycle
DD2458	Problem Solving and Programming under Pressure	9.0 hp	Second cycle
DD2469	Database Theory	6.0 hp	Second cycle
DD2471	Modern Database Systems and Their Applications	7.5 hp	Second cycle
DD2472	Database Systems for Modern Applications	6.0 hp	Second cycle
DD2483	Development of Web Applications with Enterprise Java	6.0 hp	Second cycle
DD2486	Systems Programming and Operating Systems	7.5 hp	Second cycle
DD2488	Compiler Construction	9.0 hp	Second cycle
DH2418	Language Engineering	6.0 hp	Second cycle
DH2655	Cooperative IT-design	9.0 hp	Second cycle
ID1217	Concurrent Programming	7.5 hp	First cycle
ID2003	Software Testing and Metrics	7.5 hp	Second cycle
IV2007	Enterprise Computing and ERP Systems	7.5 hp	Second cycle

# Software Engineering (PTEK)

## Year 3

### Mandatory courses (19.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">2I1251</a>	Theory of Software Metrics	6.0 hp	
<a href="#">2I1255</a>	Quality Models and Standards	6.0 hp	
<a href="#">2I1258</a>	Large-Scale Software Engineering	7.5 hp	

### Recommended courses

Code	Name	Credits	Edu. level
<a href="#">2D1410</a>	User Centred Program Development	9.0 hp	
<a href="#">2I1228</a>	Enterprise Computing and ERP Systems	7.5 hp	

## Year 4

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2I1278</a>	Computer Security - Overview	6.0 hp	

### Recommended courses

Code	Name	Credits	Edu. level
<a href="#">2I1256</a>	Current Problems in Software Engineering	6.0 hp	

# Theoretical Computer Science (TEOR)

## Year 3

### Optional courses

Code	Name	Credits	Edu. level
<a href="#">2D1373</a>	Artificial Languages and Syntax Analysis	6.0 hp	
<a href="#">2D1450</a>	Algorithmic Bioinformatics	6.0 hp	
<a href="#">2E1423</a>	Signal Theory	7.5 hp	
<a href="#">2I1140</a>	Artificial Intelligence	9.0 hp	
<a href="#">5B1305</a>	Applied Combinatorics	6.0 hp	
<a href="#">5B1750</a>	Optimization	6.0 hp	

## Year 4

### Optional courses

Code	Name	Credits	Edu. level
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2D1440	Advanced Algorithms	6.0 hp	
2D1441	Seminars on Theoretical Computer Science	6.0 hp	
2D1446	Complexity Theory	6.0 hp	
2D1449	Foundations of Cryptography	6.0 hp	
2G1117	Semantics for Programming Languages	6.0 hp	
2G1121	Logic Programming	6.0 hp	
2G1301	Theory of Distributed Systems	6.0 hp	
2G1915	Concurrent Programming	7.5 hp	
5B1467	Algebra	7.5 hp	
5B1475	Combinatorics	7.5 hp	
DD2371	Theory of Automata	6.0 hp	Second cycle
DD2380	Artificial Intelligence	6.0 hp	Second cycle
DD2395	Computer Security	6.0 hp	Second cycle
DD2440	Advanced Algorithms	6.0 hp	Second cycle
DD2441	Seminars on Theoretical Computer Science	6.0 hp	Second cycle
DD2446	Complexity Theory	6.0 hp	Second cycle
DD2447	Statistical Methods in Applied Computer Science	6.0 hp	Second cycle
DD2449	Foundations of Cryptography	6.0 hp	Second cycle
DD2450	Algorithmic Bioinformatics	6.0 hp	Second cycle
DD2452	Formal Methods	7.5 hp	Second cycle
DD2453	Advanced Formal Methods	7.5 hp	Second cycle
DD2454	Semantics for Programming Languages	6.0 hp	Second cycle
DD2455	Theoretical Foundations of Object-Orientation	7.5 hp	Second cycle
DD2458	Problem Solving and Programming under Pressure	9.0 hp	Second cycle
DD2488	Compiler Construction	9.0 hp	Second cycle
ID1217	Concurrent Programming	7.5 hp	First cycle
ID2204	Constraint Programming	7.5 hp	Second cycle
ID2213	Logic Programming	7.5 hp	Second cycle
SF1811	Optimization	6.0 hp	First cycle
SF1851	Optimization	6.0 hp	First cycle
SF2703	Algebra, Basic Course	6.0 hp	Second cycle
SF2708	Combinatorics	7.5 hp	Second cycle



# Appendix 2: Specialisations

Degree Programme in Computer Science and Engineering (D)

Autonomous Systems (AUTO)

No information entered.

Scientific Computing (BERT)

No information entered.

Biomedical Engineering (BIO)

No information entered.

Biomedical Engineering (BMT)

No information entered.

Computer Security (DATA)

No information entered.

## Distributed Systems (DIST)

No information entered.

## Computer Systems (DSYS)

No information entered.

## Computer Systems Engineering (DTEK)

No information entered.

## Industrial Information and Control Systems (IIS)

No information entered.

## Information Systems and Databases (INFO)

No information entered.

## Intelligent Interactive Systems (INTE)

No information entered.

## IT Project Management and Organisation (IPOD)

No information entered.

## Internet Working Technology (ITEK)

No information entered.

# Communication Systems (KSYS)

No information entered.

# Human-Computer Interaction (MDAT)

No information entered.

# Program System Technology (PSYS)

No information entered.

# Software Engineering (PTEK)

No information entered.

# Theoretical Computer Science (TEOR)

No information entered.