

Les enseignants, les crédits et la période des cours sont indiqués sous réserve de modification.

Code	Matières	Enseignants	Sections	Crédits	Période des cours
<b>Spécialisation A "COMPUTER ENGINEERING"</b>		<b>Responsable : Prof. P. lenne</b>		<b>62</b>	
CS-420	Advanced compiler construction	Schinz	IN	4	P
CS-470	Advanced computer architecture	lenne	IN	4	P
CS-471	Advanced multiprocessor architecture	Falsafi	IN	6	A
EE-431	* Advanced VLSI design	Burg	EL	4	P
CS-472	Design technologies for integrated systems	De Micheli	IN	6	A
ENG-466	Distributed intelligent systems	Martinoli	SIE	5	A
CS-473	Embedded systems	Beuchat	IN	4	A
CS-550	Formal verification	Kuncak	IN	6	A
EE-429	* Fundamentals of VLSI Design	Burg	EL	4	A
EE-432	* Hardware systems modeling I	Vachoux	EL	2	A
EE-433	* Hardware systems modeling II	Vachoux	EL	2	P
EE-490b	* Lab in EDA based design	Vachoux/Koukab	EL	4	A
CS-522	Principles of computer systems	Argyraiki/Candea	SC/IN	7	A
CS-476	Real-time embedded systems	Beuchat	IN	4	P
<b>Spécialisation B "DATA ANALYTICS"</b>		<b>Responsable : Prof. M. Grossglauser/Prof. P. Thiran</b>		<b>102</b>	
EE-558	* A network tour of data science	Frossard/Vandergheynst	EL	4	A
CS-450	Advanced algorithms	Svensson	IN	7	P
COM-417	Advanced probability and applications	Lévêque	SC	6	P
CS-401	Applied data analysis	West	SC	6	A
CS-524	Computational complexity	(pas donné en 2019-2020) Svensson	IN	4	A
CS-422	Database systems	Ailamaki	IN	7	P
COM-480	Data visualization	(pas donné en 2019-2020) vacat	SC	4	A
CS-423	Distributed information systems	Aberer	SC	4	P
COM-402	Information security and privacy	Hubaux/Oechslin/Troncoso	SC/IN	6	A
COM-404	Information theory and coding	Telatar	SC	7	A
COM-308	* Internet analytics	Grossglauser	SC	5	P
CS-431	Introduction to natural language processing	Rajman/Chappelier	IN	4	A
CS-433	Machine learning	Jaggi/Urbanke	IN	7	A
COM-516	Markov chains and algorithmic applications	Lévêque/Macris	SC	4	A
COM-512	Networks out of control	Thiran P./Grossglauser	SC	4	P
COM-503	Performance evaluation	(pas donné en 2019-2020) Le Boudec	SC	7	P
COM-500	Statistical signal and data processing through applications	Ridolfi	SC	6	P
MATH-413	* Statistics for Data science	Olhede	MA	6	A
CS-455	Topics in theoretical computer science	Kapralov	IN	4	P
<b>Spécialisation C "FOUNDATIONS OF SOFTWARE"</b>		<b>Responsable : Prof. M. Odersky</b>		<b>53</b>	
CS-450	Advanced Algorithms	Svensson	IN	7	P
CS-420	Advanced compiler construction	Schinz	IN	4	P
CS-453	Concurrent algorithms	Guerraoui	SC	5	A
CS-422	Database Systems	Ailamaki	IN	7	P
CS-451	Distributed algorithms	Guerraoui	SC	6	A
CS-550	Formal verification	Kuncak	IN	6	A
CS-452	Foundations of software	Odersky	IN	4	A
COM-503	Performance evaluation	(pas donné en 2019-2020) Le Boudec	SC	7	P
CS-522	Principles of computer systems	Argyraiki/Candea	SC/IN	7	A
<b>Spécialisation D "CYBER SECURITY"</b>		<b>Responsable : Prof. C. Troncoso</b>		<b>85</b>	
CS-450	Advanced algorithms	Svensson	IN	7	P
CS-470	Advanced computer architecture	lenne	IN	4	P
COM-501	* Advanced cryptography	Vaudenay	SC	4	P
CS-523	Advanced topics on privacy enhancing technologies	Hubaux/Troncoso	IN/SC	7	P
EE-431	* Advanced VLSI design	Burg	EL	4	P
MATH-409	Algebraic curves in cryptography	(pas donné en 2019-2020) Jetchev	MA	5	P
COM-401	Cryptography and security	Vaudenay	SC	7	A
CS-550	Formal verification	Kuncak	IN	6	A
EE-429	* Fundamentals of VLSI Design	Burg	EL	4	A
COM-402	Information security and privacy	Hubaux/Oechslin/Troncoso	SC/IN	6	A
EE-552	* Media security	Ebrahimi	EL	6	P
COM-405	Mobile networks	Hubaux	SC	4	P
MATH-489	Number theory in cryptography	vacat	MA	5	A
CS-522	Principles of computer systems	Argyraiki/Candea	SC/IN	7	A
CS-412	Software security	Payar	IN	6	P
COM-506	* Student seminar : security protocols and applications	Oechslin/Vaudenay	SC	3	P
COM-407	TCP/IP Networking	Le Boudec	SC	6	A

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<b>Spécialisation E "NETWORKING AND MOBILITY"</b>		<b>Responsable : Prof. J.-Y. Le Boudec</b>		<b>50</b>	
CS-450	Advanced algorithms	Svensson	IN	7	P
CS-453	Concurrent algorithms	Guerraoui	SC	5	A
COM-401	Cryptography and security	Vaudenay	SC	7	A
CS-423	Distributed information systems	Aberer	SC	4	P
COM-402	Information security and privacy	Hubaux/Oechslin/Troncoso	SC/IN	6	A
COM-405	Mobile networks	Hubaux	SC	4	P
COM-430	Modern digital communications : A hands-on approach	Rimoldi	SC	6	A
COM-512	Networks out of control	Thiran P./Grossglauser	SC	4	P
COM-503	Performance evaluation (pas donné en 2019-2020)	Le Boudec	SC	7	P
COM-407	TCP/IP networking	Le Boudec	SC	6	A
<b>Spécialisation F "SIGNAL, IMAGES AND INTERFACES"</b>		<b>Responsable : Prof. M. Vetterli</b>		<b>96</b>	
CS-440	Advanced computer graphics	Jakob	IN	6	P
COM-415	Audio and acoustic signal processing	Faller/Kolundzija	SC	5	A
EE-554	Automatic speech processing	Boullard	EL	3	A
EE-512	Biomedical signal processing	Vesin	EL	6	A
CS-413	Computational photography	Sisstrunk	SC	5	P
CS-442	Computer vision	Fua	IN	4	P
CS-446	Digital 3D geometry processing	Pauly	IN	5	A
CS-489	Experience design	Huang	IN	6	A
EE-550	Image and video processing	Ebrahimi	EL	6	A
MICRO-511	Image processing I	Unser/Van De Ville	MT	3	A
MICRO-512	Image processing II	Unser/Van De Ville	MT	3	P
CS-341 *	Introduction to computer graphics	Pauly	IN	6	P
CS-433	Machine learning	Jaggi/Urbanke	IN/SC	7	A
COM-514	Mathematical foundations of signal processing	Kolundzija/Scholefeld/Parhizkar	SC	6	A
COM-430	Modern digital communications : A hands-on approach	Rimoldi	SC	6	A
EE-511	Sensors in medical instrumentation	Aminian	EL	3	P
COM-303 *	Signal processing for communications	Prandoni	SC	6	P
COM-500	Statistical signal and data processing through applications	Ridolfi	SC	6	P
CS-444	Virtual reality	Boulic	IN	4	P
<b>Spécialisation G "SOFTWARE SYSTEMS"</b>		<b>Responsable : Prof. G. Candea</b>		<b>72</b>	
CS-420	Advanced compiler construction	Schinz	IN	4	P
CS-470	Advanced computer architecture	Jenne	IN	4	P
CS-471	Advanced multiprocessor architecture	Falsafi	IN	6	A
CS-453	Concurrent algorithms	Guerraoui	SC	5	A
CS-422	Database Systems	Ailamaki	IN	7	P
CS-438	Decentralized systems engineering	Ford	IN	6	A
CS-451	Distributed algorithms	Guerraoui	SC	6	A
CS-452	Foundations of software	Odersky	IN	4	A
COM-402	Information security and privacy	Hubaux/Oechslin/Troncoso	SC/IN	6	A
COM-405	Mobile networks	Hubaux	SC	4	P
COM-503	Performance evaluation (pas donné en 2019-2020)	Le Boudec	SC	7	P
CS-522	Principles of computer systems	Argyrazi/Candea	SC/IN	7	A
COM-407	TCP/IP networking	Le Boudec	SC	6	A
<b>Spécialisation H "WIRELESS COMMUNICATIONS"</b>		<b>Responsable : Prof. E. Telatar</b>		<b>50</b>	
COM-417	Advanced probability and applications	Lévesque	SC	6	P
CS-454	Convex optimization and applications (pas donné en 2019-20)	Lebrét	MTE	4	P
COM-404	Information theory and coding	Telatar	SC	7	A
EE-445 *	Microwaves	Skrivervik	EL	4	A
COM-405	Mobile networks	Hubaux	SC	4	P
COM-430	Modern digital communications : A hands-on approach	Rimoldi	SC	6	A
COM-512	Networks out of control	Thiran P./Grossglauser	SC	4	P
EE-345 *	Rayonnement et antennes	Skrivervik	EL	3	A
COM-500	Statistical signal and data processing through applications	Ridolfi	SC	6	P
COM-407	TCP/IP networking	Le Boudec	SC	6	A

**Légende :**

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A = automne, P = printemps - 1 semestre comprend 14 semaines

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<b>Spécialisation I. "COMPUTER SCIENCE THEORY"</b>		<b>Responsable : Prof. O. Svensson</b>		<b>85</b>	
CS-450	Advanced algorithms	Svensson	IN	7	P
COM-417	Advanced probability and applications	Lévêque	SC	6	P
MATH-460 *	Combinatorial optimization (pas donné en 2019-2020)	Eisenbrand	MA	5	A
CS-524	Computational complexity (pas donné en 2019-2020)	Svensson	IN	4	A
FIN-472 *	Computational finance	Pulido/Glau	IF	5	A
CS-453	Concurrent algorithms	Guerraoui	SC	5	A
MATH-461 *	Convexity (pas donné en 2019-2020)	Eisenbrand	MA	5	A
CS-451	Distributed algorithms	Guerraoui	SC	6	A
MATH-483	Gödel and recursivity (pas donné en 2019-2020)	Duparc	MA	5	A
COM-404	Information theory and coding	Telatar	SC	7	A
CS-433	Machine learning	Jaggi/Urbanke	IN/SC	7	A
COM-516	Markov chains and algorithmic applications	Lévêque/Macris	SC	4	A
COM-300 *	Modèles stochastiques pour les communications	Thiran	SC	6	A
MATH-467	Probabilistic method (pas donné en 2019-2020)	Pach	MA	5	A
CS-448	Sublinear algorithms for big data analysis (pas donné en 2019-2020)	Kapralov	IN	4	P
CS-455	Topics in theoretical computer science	Kapralov	IN	4	P
<b>Spécialisation J. "INTERNET INFORMATION SYSTEMS"</b>		<b>Responsable : Prof. B. Faltings et Prof. K. Aberer</b>		<b>64</b>	
COM-401	Cryptography and security	Vaudenay	SC	7	A
CS-422	Database systems	Ailamaki	IN	7	P
CS-451	Distributed algorithms	Guerraoui	SC	6	A
CS-423	Distributed information systems	Aberer	SC	4	P
CS-491	Enterprise and service-oriented architecture	Wegmann	SC	6	P
CS-486	Human-computer interaction	Pu	IN	4	P
CS-430	Intelligent agents	Faltings	IN	6	A
CS-431	Introduction to natural language processing	Rajman/Chappelier	IN	4	A
CS-433	Machine learning	Jaggi/Urbanke	IN/SC	7	A
COM-512	Networks out of control	Thiran P./Grossglauser	SC	4	P
COM-503	Performance evaluation (pas donné en 2019-2020)	Le Boudec	SC	7	P
EE-593	Social Media	Gillet/Holzer	EL	2	P

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