







Search result: Course units in Autumn Semester 2024









Course units	Catalogue data	Courses	Browse
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Quantum Engineering Master 					
<div>► Core Courses</div> <div>A minimum of 24 credits must be obtained from core courses during the MSc QE, course selection is subject to the tutor's agreement.</div>					
<div>► ► Quantum Technology Lab</div> <div>This core course is a prerequisite for participation in the QuanTech Labs of the second and third semester.</div>					
Number	Title	Type	ECTS	Hours	Lecturers
227-1831-10L	Case Studies: Applications of Quantum Technology  	W+	3 credits	6G	G. Raino, M. Frimmer


<div>► ► Engineering Core Courses</div> <div>These core courses target students with a physics background and all those who need additional engineering foundations.</div>					
Number	Title	Type	ECTS	Hours	Lecturers
227-0103-00L	Control Systems 	W	6 credits	2V + 2U	F. Dörfler
227-0116-00L	VLSI 1: HDL Based Design for FPGAs 	W	6 credits	5G	F. K. Gürkaynak
227-0166-00L	Analog Integrated Circuits 	W	6 credits	4G	T. Jang
227-0301-00L	Optical Communication Fundamentals	W	6 credits	2V + 1U + 1P	J. Leuthold
227-0417-00L	Information Theory I	W	6 credits	4G	A. Lapidoth

<div>► ► Physics Core Courses</div> <div>These core courses target students with an engineering background and all those who need additional physics foundations.</div>					
Number	Title	Type	ECTS	Hours	Lecturers
402-0205-00L	Quantum Mechanics I <div>Physics BSc students with programme regulations 2016 need to register for "402-0205-10L Quantenmechanik I"</div> <div>A repetition week is offered in the middle of the semester.</div>	W	8 credits	3V + 2U	M. Krstic Marinkovic




402-0209-00L	Quantum Physics for Non-Physicists	W	6 credits	3V + 2U	P. Kammerlander
402-0255-00L	<b>Introduction to Solid State Physics</b> Physics BSc students with programme regulations 2016 need to register for "402-0255-10L Einführung in die Festkörperphysik".  A repetition week is offered in the middle of the semester.	W	8 credits	3V + 2U	A. Zheludev
402-0442-00L	Quantum Optics	W	10 credits	3V + 2U	A. Imamoglu
402-0448-01L	<b>Quantum Information Processing I: Concepts</b> This theory part QIP I together with the experimental part 402-0448-02L QIP II (both offered in the autumn semester) combine to the core course in experimental physics "Quantum Information Processing" (totally 10 ECTS credits). This applies to the Master's degree programme in Physics.	W	5 credits	2V + 1U	J. Renes
402-0448-02L	<b>Quantum Information Processing II: Implementations</b> This experimental part QIP II together with the theory part 402-0448-01L QIP I (both offered in the autumn semester) combine to the core course in experimental physics "Quantum Information Processing" (totally 10 ECTS credits). This applies to the Master's degree programme in Physics.	W	5 credits	2V + 1U	A. Wallraff, J.-C. Besse
402-0861-00L	Statistical Physics	W	10 credits	4V + 2U	M. Sigrist

<div> <div>▶ Electives</div> <div>This is a selection of courses particularly suitable for the MSc QE. In agreement with the tutor, students may choose other courses from the ETH course catalogue.</div> </div>					
Number	Title	Type	ECTS	Hours	Lecturers
227-0053-00L	High-Frequency Design Techniques 	W	4 credits	2V + 2U	C. Bolognesi, T. Popovic
227-0101-00L	Discrete-Time and Statistical Signal Processing 	W	6 credits	4G	H.-A. Loeliger
227-0145-00L	Solid State Electronics and Optics 	W	6 credits	4G	N. Yazdani, V. Wood
227-0146-00L	<b>Data Conversion System Design</b>  Up until HS23 named Analog-to-Digital Converters	W	6 credits	2V + 2U	T. Burger, G. Cervelli, R. Reutemann
227-0157-00L	Semiconductor Devices: Physical Bases and Simulation 	W	4 credits	3G	A. Schenk, C. I. Roman
227-0166-00L	Analog Integrated Circuits 	W	6 credits	4G	T. Jang
227-0225-00L	Linear System Theory	W	6 credits	5G	J. Lygeros, A. Tsiamis
227-0311-00L	Qubits, Electrons, Photons	W	6 credits	3V + 2U	T. Zambelli
227-0468-00L	<b>Analog Signal Processing and Filtering</b>  Suitable for Master Students as well as Doctoral Students.	W	6 credits	2V + 2U	H. Schmid
227-0653-00L	<b>Quantum Measurements and Optomechanics</b> Quantum Measurements and Optomechanics	W	6 credits	2V + 2U	M. Frimmer
402-0465-58L	<b>Intersubband Optoelectronics</b> Does not take place this semester.	W	6 credits	2V + 1U	G. Scalari, J. Faist
227-0663-00L	<b>Nano-Optics</b>  Does not take place this semester.	W	6 credits	2V + 2U	M. Frimmer

151-0563-01L	Dynamic Programming and Optimal Control 	W	4 credits	2V + 1U	R. D'Andrea
252-0535-00L	Advanced Machine Learning 	W	10 credits	3V + 2U + 4A	J. M. Buhmann, C. Cotrini Jimenez
252-0836-00L	Computer Science II 	W	4 credits	2V + 2U	R. Sasse, F. Friedrich Wicker
402-0257-00L	Advanced Solid State Physics	W	10 credits	3V + 2U	W. Wegscheider
402-0317-00L	Semiconductor Materials: Fundamentals and Fabrication	W	6 credits	2V + 1U	S. Schön, W. Wegscheider
402-0402-00L	Ultrafast Laser Physics 	W	10 credits	3V + 2U	L. Gallmann
402-0442-05L	Advanced Topics in Quantum Optics 	W	4 credits	2G	T. Esslinger
402-0444-00L	Dissipative Quantum Systems <small>  Does not take place this semester.</small>	W	6 credits	2V + 1U	A. Imamoglu
402-0457-00L	Quantum Technologies for Searches of New Physics <small>  Does not take place this semester.</small>	W	6 credits	2V + 1U	P. Crivelli
402-0464-00L	Light-Matter Interaction in Semiconductors: Physics and Applications	W	8 credits	2V + 2U	T. Smolenski, A. Dikopoltsev
402-0468-15L	Nanomaterials for Photonic Devices	W	6 credits	2V + 1U	R. Grange, E. Bailly, R. Chapman, V. Falcone, A. Morandi
402-0469-67L	Classical and Quantum Parametric Phenomena	W	6 credits	3G	A. Eichler, A. Grimm
402-0492-00L	Experimental Techniques in Quantum and Electro-Optics	W	6 credits	2V + 1U	D. Kienzler, D. Prado Lopes Aude Craik
402-0535-00L	Introduction to Magnetism 	W	6 credits	3G	A. Vindigni
402-0595-00L	Semiconductor Nanostructures	W	6 credits	2V + 1U	T. M. Ihn
402-0810-70L	Advanced Quantum Algorithms (University of Zurich) <small>No enrolment to this course at ETH Zurich. Book the corresponding module directly at UZH as an incoming student. UZH Module Code: PHY582</small>  <small>Mind the enrolment deadlines at UZH: <a href="https://www.uzh.ch/cmsssl/en/studies/application/deadlines.html">https://www.uzh.ch/cmsssl/en/studies/application/deadlines.html</a></small>	W	6 credits	2V + 1U	G. Mazzola

► Semester Project					
Number	Title	Type	ECTS	Hours	Lecturers
227-1871-00L	Semester Project  <small>Registration in myStudies required! Supervisor must be a professor at D-ITET or D-PHYS, see <a href="http://master-qe.ethz.ch/education/semester-project.html">http://master-qe.ethz.ch/education/semester-project.html</a></small>	O	12 credits	20A	Supervisors

► Internship					
Number	Title	Type	ECTS	Hours	Lecturers

227-1873-00L	Internship in Industry 	W	12 credits		external organisers
227-1873-10L	QuanTech Workshops 	W	12 credits	2P	G. Raino, M. Frimmer
▶ Master's Thesis					
Number	Title	Type	ECTS	Hours	Lecturers
227-1800-00L	<b>Master's Thesis</b>  Admission only if ALL of the following apply: a) bachelor program successfully completed b) acquired (if applicable) all credits from additional requirements for admission to master program c) acquired the minimum number of credits in the 'core courses' category d) successfully completed the internship e) successfully completed the semester project  Important: - registration in myStudies required - supervisor must be a professor at D-ITET or D-PHYS, see <a href="http://master-qe.ethz.ch/education/master-project.html">http://master-qe.ethz.ch/education/master-project.html</a> .	O	30 credits	68D	Supervisors

▶ Science in Perspective   Only courses offered under "GESS Science in Perspective" count in this category. See "Offered in" tab in course view. For more information, please refer to <a href="https://gess.ethz.ch/en/studies/science-in-perspective/SIP-FAQs.html">https://gess.ethz.ch/en/studies/science-in-perspective/SIP-FAQs.html</a>					
» see Science in Perspective: Language Courses ETH/UZH					
» see Science in Perspective: Type A: Enhancement of Reflection Capability					
» Recommended Science in Perspective (Type B) for D-ITET					