

Elective modules

Module number	Module name	1 st semester	2 nd semester	3 rd semester	Credits
		Lecture (Lecturer) (L/E/P)	Lecture (Lecturer) (L/E/P)	Lecture (Lecturer) (L/E/P)	
Eui-NES-E-GLC	German Language and Culture	German Language and Culture (TUDIAS) (4 language courses)			5
Eui-NES-E-PlaTe	Plasma Technology	Plasma Technology (Hauff, Žukauskaitė) (4/2/0)			7
INF-NES-E-SE1	Foundations of Systems Engineering	Systems Engineering 1 (Fetzer) (2/2/0)			6
Eui-NES-E-StSig	Stochastic Signals and Systems	Stochastic Signals and Systems (Schaefer) (2/2/0)			6
Eui-NES-E-NNMHA	Neural Networks and Memristive Hardware Accelerators	Neural Networks and Memristive Hardware Accelerators (Schroedter) (2/0/2, 2 project)			7
Eui-NES-E-LSer	Requirements and methodologies for design of integrated circuits from industrial production perspective		Requirements and methodologies for design of integrated circuits from industrial production perspective (Schulz) (4/0/0)		5
WIWI-NES-E-ResM	Resource Management		Ressource Management (Günther) (2/0/0) 2 project		5
PHY-NES-E-NanSc	Nanoscience		Nanotechnology (Eng) (2/0/0) Scanning Probe Microscopy (Eng) (2/0/0)		6
MW-NES-E-NSM	Nanostructured Materials		Nanostructured Materials (Cuniberti) (2/2/2)		7
NES-E-AdLsy	Adaptive Laser Systems		Laser Metrology and Quantum Technology (Czarske) (2/1/0) Laser Sensor Technology Lab (Czarske) (0/0/1)		5
Eui-NES-E-ARS	Antennas and Radar Systems		Antennas and Radar Systems (Plettmeier) (4/2/0)		7
Eui-NES-E-Comms	Communications		Communications (Fettweis) (2/1/1)		5
INF-NES-E-SFT	Foundations of Software-Fault Tolerance		Software Fault Tolerance (Fetzer) (2/2/0)		6
INF-NES-E-WSN	Wireless Sensor Networks		Wireless Sensor Networks (Dargie) (2/2/0)		6
INF-NES-E-ACSR	Adaptive Computing Systems for Robotics		Adaptive Computing Systems for Robotics (Göhringer) (2/2/0)		6
Eui-NES-E-DNNH	Deep Neural Network Hardware		Deep Neural Network Hardware (Mayr) (2/2/0)		5
INF-NES-E-EMA	Design and Programming of Embedded Multicore Architectures		Design and Programming of Embedded Multicore Architectures (Göhringer) (2/2/0)		6
Eui-NES-E-ICDBS	Integrated Circuit Design for Biomedical Sensors		Integrated Circuit Design for Biomedical Sensors (Bahr) (2/0/2)		7
Eui-NES-E-ONC	Introduction to Optical Nonclassical Computing: Concepts and Devices		Introduction to Optical Nonclassical Computing: Concepts and Devices (Jamshidi) (4/2/0)		7
Eui-NES-E-NVLSI	Neuromorphic VLSI Systems		Neuromorphic VLSI Systems (Mayr) (4/2/0)		7
Eui-NES-E-PD	Physical Design		Physical Design (Fettweis/ Sen/ Haas) (2/0/1)		6
Eui-NES-E-VLSI	VLSI Processor Design		VLSI Processor Design (Mayr) (2/2/2)		7
Eui-NES-E-3DSI	Materials for the 3D System Integration		3D System Integration and 3D Technologies (Panchenko) (2/0/0)	Micro-/Nanomaterials and Reliability Aspects (Panchenko) (2/0/1, one day excursion)	7
Eui-NES-E-MemTe	Memory Technology		Memory Technology 1 (Mikolajick) (2/0/0, 1 seminar)	Memory Technology 2 (Mikolajick) (2/0/0, 1 seminar)	7
PHY-NES-E-NanOp	Nano&Optics			Modern Optics (Reineke) (2/0/0) NanoOptics (Eng) (2/0/0)	6
Eui-NES-E-ICAND	Innovative Concepts for Active Nanoelectronic Devices			Materials for Nanotechnology (Richter) (2/0/1) Innovative Semiconductor Devices (Mikolajick) (2/1/0)	7
MW-NES-E-MoEI	Molecular Electronics			Molecular Electronics (Cuniberti/Moresco) (2/2/0)	5
Eui-NES-E-OPTO	Optoelectronic Devices and Systems			Optoelectronic Devices and Systems (Lakner) (2/1/1)	5
PHY-NES-E-QMNE	Quantum Mechanics for Nanoelectronics			Semiconductor Quantum Structures (Helm) (2/0/0) Quantum and solid state physics (Scholz) (3/1/0)	7
NES-12 10 20	Communication Networks 3			Communication Networks 3 (Fitzek) (3/0/0) CN-Actual Topics-Problem based learning (Fitzek) (1/2/0)	7

EuI-NES-E-ComLS	Computational Laser Systems			Digital Holography and Image Processing (Czarske) (1/1/0) Biomedical Laser Systems and Optogenetics (Czarske) (2/0/0)	5
EuI-NES-E-FED	Fundamentals of Estimation and Detection			Fundamentals of Estimation and Detection (Fettweis) (2/2/0)	6
EuI-NES-E-HJCAS	Joint Communication and Sensing RF Hardware			Joint Communication and Sensing RF Hardware (Fettweis/ Sen) (2/0/0, 1 tutorial)	5
INF-NES-E-IoT	IoT Communication			IoT Communication (Wählsch) (2/2/0)	6
INF-NES-E-DS	Distributed Systems			Distributed Systems (Springer) (2/2/0)	6
EuI-NES-E-EMNet	Electromechanical Networks			Electromechanical Networks (Marschner) (2/1/1)	5
EuI-NES-E-FCPL	Foundations of Certified Programming Language and Compiler Design			Foundations of Certified Programming Language and Compiler Design (Ertel) (2/2/0)	6
INF-NES-E-HMS	Hardware Modelling and Simulation			Hardware Modelling and Simulation (Göhringer) (2/2/0)	6
EuI-NES-E-ICBC	Integrated Circuits for Broadband Optical Communications			Integrated Circuits for Broadband Optical Communications (Ellinger) (3/1/2)	7
EuI-NES-E-IPD	Integrated Photonic Devices for Communications and Signal Processing			Integrated Photonic Devices for Communications and Signal Processing (Jamshidi) (4/0/2)	7

Last updated: 23rd of July, 2025

- L Lecture in hours per week (2 = 90 minutes)
E Exercise in hours per week (2 = 90 minutes)
P Practical lab course in hours per week (2 = 90 minutes)

Key areas:

Technology

Design

Applications