#### Courses MSc Sustainable Energy Technology 2023/24

# Homologation course Homologation course for specialization Specialization course

30 EC

Homologation modules are part of free electives. The total amount of bachelor and homologation courses may not exceed 15 EC.
Homologation is strongly advised, depending on student's background. See information at the online education guide for target groups (see footnote nr 7)

Credits

 $Students \ need \ to \ choose \ at \ least \ 15 \ EC \ of \ specialization \ courses \ from \ this \ list. \ Suggestions for \ specialization \ courses \ are \ indicated \ for \ each \ profile.$ 

### SET profiles for specialization:



1	Chemistry for sustainable energy systems (PMP; CEC groups)
2	Engineering for sustainable energy systems (P&F ET; CEC groups)
3	Systems for sustainable heat (ET; P&F TPM; CEC groups)
4	Electrical power systems (EPE; EES)
5	Application in the built environment (BPS; ET)
6	Energy & society (TIS)

#### Quarter 1

7LY3M0	Building performance and energy systems simulation	5	С
5LEE0 [1]	Electrical power engineering and system integration	5	D
4WM20	Homologation Matlab Simulink	2.5	E1
4SE010	Homologation Heat, Flow and Thermodynamics	2.5	E2, E3
3MB010	Physics of Plasma and Radiation	5	A
3MS010	Advanced fluid dynamics	5	E
7XC1M0 <sup>[2]</sup>	Circularity in the built environment	5	A
7LY5M0	Data science for intelligent buildings	5	В
7LS3M0	Sustainable Buildings/Physical Aspects of Building Materials	5	A
6EMA53 <sup>[3][4]</sup>	Molecular photophysics	5	D
5LWE0	Control of Rotating Field Machines	5	A
5LWH0 <sup>[4]</sup>	Modelling & control of power converters	5	С
5LEL0	Power Quality Phenomena	5	E
0EM110 <sup>[5]</sup>	Research methodology for the Innovation Sciences	5	В
4BM60 <sup>[4]</sup>	Interfacial transport phenomena for engineering flows	5	D2, D3
4RM00 <sup>[6]</sup>	Introduction to Computational Fluid Dynamics	5	В
	SLEED <sup>[1]</sup> 4WM20 4SE010 3MB010 3MS010 7X:L1M0 <sup>[2]</sup> 7L'SM0 7LSM0 6EMAS3 <sup>[3][4]</sup> SLWE0 SLWE0 SLWE0 6EMAS4 <sup>[4]</sup> 48M60 <sup>[4]</sup>	SLEED II Electrical power engineering and system integration  485010 Homologation Matlab Simulank  485010 Homologation Heat, Flow and Thermodynamics  3M8010 Advanced fluid dynamics  3K5010 Advanced fluid dynamics  7XC1M0 <sup>91</sup> Circularity in the built environment  7XSMO Data science for intelligent buildings  7XSMO Data science for intelligent buildings  5XSMO Sastainable Buildings/Physical Aspects of Building Materials  6EMAS3 <sup>9041</sup> Molecular phrotophysics  5XWE0 Control of Rotating Field Machines  5XWE0 Control of Rotating Field Machines  5XHUPI Rodelling & Control of power converters  5XELD Power Quality Phenomena  0EM110 <sup>811</sup> Research methodology for the Innovation Sciences  4BM60 <sup>941</sup> Interfacial transport phenomena for engineering flows	SLEED

1	2	3	4	5	6

#### Quarter 2

ME, AP, B	4EM70 <sup>[7]</sup>	Sustainable energy sources	5	A
IE&IS	0EM140	Energy, economy and society	5	E
AP Transport in Permeable Media	3MT160	Introduction to NMR/MRI for imaging and flow visualisation	5	С
BE Building Physics and Services	75880	Lighting Technology	5	С
BE Building Physics and Services	7ZW5M0	Smart healthy urban environments	5	D
CEC Chemical Engineering and Chemistry	6EMA08 <sup>[3][4]</sup>	Multiphase computational fluid dynamics	5	А
EE Electromechanics and Power Electronics	5AT010	Electrical components	2.5	C2
EE Electromechanics and Power Electronics	5SWA0	Rotary permanent magnet machines	5	D
EE Electrical Energy Systems	5SEE0	Planning & Operation of Electrical Power Systems	2.5	D2
EE Electrical Energy Systems	5SED0	Electrical energy systems in transition	2.5	C2
ME Power & Flow	4BM30	Modelling combustion	5	D
ME Power & Flow	4BM20 <sup>[4]</sup>	Experimentation for MW	5	E
ME Energy Technology	4EM10	Gasdynamics	5	B2, B3
ME Energy Technology	4EM40 <sup>[8]</sup>	Heat and flow in microsystems	5	С
ME Energy Technology	4SE20ONL <sup>[8]</sup>	Microscale modeling of heat storage materials (online)	5	C (exam)

#### Quarter 3

EE, IE&IS	5LEF0	System integration project - part 1	×	В
AP Plasma and Materials Processing	3MP170 <sup>[4]</sup>	Plasma processing science and technology	5	В
AP Plasma and Materials Processing	3MP110	Solar cells	5	D
BE Building Physics and Services	7LS9M0 <sup>[4][6]</sup>	Heat, Air & Moisture Transfer/CFD 1	5	B+C
EE Electromechanics and Power Electronics	5SWB0	Advanced power electronics	5	A
EE Electromechanics and Power Electronics	5XWB0 <sup>[4][9]</sup>	Electric drive systems	5	В
EE Electrical Energy Systems	5LEG0	Pulsed power technology	5	D
EE Electrical Energy Systems	5SEF0	Smart grids, ICT and electricity markets	5	D2
EE Electrical Energy Systems	SLEA0	Protection and automation of distribution networks	2.5	С
IE&IS Technology, Innovation & Society	0EM150	Sustainability transitions and responsible innovation	5	С
IE&IS Technology, Innovation & Society	0EM200	International development and sustainability	5	E
CEC Molecular Catalysis	6EMAC2 <sup>[3]</sup>	Modern concepts in catalysis	5	С
CEC Chemical Reaction Engineering	6EMAC6 [3]	Electrochemical engineering	5	D
ME Power & Flow	4BM50	Energy Geoscience	2.5	D
ME Power & Flow	4BM10	Hydraulic turbomachines	5	E
ME Energy Technology	4EM50 [10]	Thermal energy storage	2.5	A2
ME Energy Technology	4SE30ONL <sup>[10]</sup>	Thermal energy storage and demand (online)	5	A2

## Quarter 4

EE, IE&IS	5LEF0	System integration project - part 2	10	В
AP Transport in Permeable Media	3MT130	Transport in porous media	5	E
BE Building Physics and Services	7LS6M0 <sup>[6]</sup>	Heat, Air & Moisture Transfer/CFD 2	5	E
CEC Chemical Reaction Engineering	6EMA06 <sup>[3][4]</sup>	Advanced process design	5	В
EE Electromechanics and Power Electronics	5LEJ0	Secondary batteries and hydrogen storage	2.5	A2
EE Electromechanics and Power Electronics	5LWG0 <sup>[4]</sup>	Power electronics for high-precision applications	5	B2, B3
EE Electrical Energy Systems	5XWA0 <sup>[9]</sup>	Power System Analysis and Optimization	5	E
EE Electrical Energy Systems	5LEM0	Dynamic control of power conversion in renewable energy systems	5	E2
EE Electrical Energy Systems	5LEN0	Power System Stability and Dynamics	2.5	C1
IE&IS Technology, Innovation & Society	0EM310 <sup>[2]</sup>	Sustainability assessment for decision making	5	D
ME Power & Flow	4BM40	Optical diagnostics for combustion and fluid flow	5	А
ME Power & Flow	4AT020	Clean engines and future fuels	5	С
ME Energy Technology	4EM80	Monte Carlo Simulations for Energy Applications	5	E
ME Energy Technology	4CBLM00	Energy transition – the path towards net zero	5 EC Summersch	

## Check actual information about quarter and timeslot in OSIRIS catalogue

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  "In Opf in Sudents with old 54/800 electrical power systems in their borbelor's program. These students take an additional specialization course, recommended are Electrical Energy Systems in Transition (2.5 EC) and Planning & Operation of Electrical Power Systems (2.5 EC)

  "When selecting the course YECLMO the course BEM310 cannot be selected

  "For students with a bookelor in Chee. They, or compandible other students please check the entrance requirements. As prior knowledge for courses SEMAC6 and 6EMA06, 6P3X0 (Chemical Reactors) is recommended.

  "This course is scheduled in the same time slot as a core course

  "A montainty expecialation course for students specialized with the "Energy Society" profile.

  "When selecting the course 48M00 the coursely 1759M0 and/or 7358M0 cannot be selected

  "Hemologotion heet, flow and Thermodynamic's stronged velocify for students who did not bus the least, flow and Thermodynamics courses in their backelor's program."

  "When selecting the course 44M00 the coursely 2500M1 cannot be selected. Written examination on compus.

  "When selecting the course 45M00 the course 45S00M1 cannot be selected. Written examination on campus.